FLORA OF TROPICAL AFRICA.

187
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FLORA

OF

TROPICAL AFRICA.

BY

DANIEL OLIVER, F.R.S., F.L.S.,

KEEPER OF THE HERBARIUM AND LIBRARY IN THE ROYAL GARDENS, KEW, AND PROFESSOR OF BOTANY IN UNIVERSITY COLLEGE, LONDON.

ASSISTED BY OTHER BOTANISTS.

VOL. II.

LEGUMINOSÆ TO FICOIDEÆ.

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CONTENTS.

Page

CONSPECTUS OF THE ORDERS vii

Order XLVII. Leguminosæ 1

Suborder 1. Papilionaceæ 1

2. Cæsalpinieæ 258

3. Mimoseæ 321

Order XLVIII. Rosaceæ 364

XLIX. Saxifragaceæ 382

L. Crassulaceæ 385

LI. Droseraceæ 401

LII. Hamamelideæ 403

LIII. Halorageæ 404

LIV. Rhizophoreæ 406

LV. Combretaceæ 413

LVI. Myrtaceæ 436

LVII. Melastomaceæ 439

LVIII. Lythraceæ 464

LIX. Onagrarieæ 486

LX. Samydaceæ 492

LXI. Loasaceæ 500

LXII. Turneraceæ 501

LXIII. Passifloreæ 503

LXIV. Cucurbitaceæ 521

LXV. Begoniaceæ 569

LXVI. Cactaceæ 580

LXVII. Ficoideæ 581

CONSPECTUS OF THE ORDERS CONTAINED IN THE SECOND VOLUME.

Class. I. DICOTYLEDONES.

Subclass I. POLYPETALÆ.

Cohort XI. Rosales (continued from Vol. I. p. 4). Flowers regular or irregular, usually hermaphrodite. Stamens more or less distinctly perigynous. Styles distinct (except *Brexia*).

XLVII. Leguminosæ. Trees, shrubs or herbs. Leaves compound or simple. Flowers irregular or regular. Stamens definite or indefinite, free or connate. Carpel solitary; ovules 1–2–∞, attached to the ventral suture.

XLVIII. Rosaceæ. Herbs, shrubs or trees. Leaves usually alternate and stipulate, simple or compound. Flowers regular (polygamous or diœcious in *Pygeum*, *Brayera*, *Cliffortia*). Stamens usually indefinite. Carpels 1 or more, free or consolidated with the receptacle; ovules 1 or 2. Seeds exalbuminous.

XLIX. Saxifragaceæ. Herbs or a shrub (*Brexia*). Leaves alternate or opposite, exstipulate. Flowers regular, hermaphrodite. Stamens iso- or diplostemonous; filaments free. Pistil syncarpous, digynous (or monogynous in *Brexia*); ovules ∞.

L. Crassulaceæ. Herbs, usually succulent. Leaves opposite or alternate. Flowers regular, hermaphrodite. Stamens iso- or diplostemonous; filaments free or epipetalous. Pistil apo- or syncarpous; carpels as many as petals, usually ∞-ovulate. Seeds albuminous.

LI. Droseraceæ. Glandular-pilose herbs. Flowers regular, hermaphrodite. Ovary 1-celled with 2–5 simple or bipartite styles.

LII. Hamamelideæ. (*Myrothamnus* only.) Glabrous shrub. Leaves opposite. Flowers spicate, diœcious, achlamydeous. Stamens 4–8. Pistil 3–4-carpellary, multiovulate.

LIII. Haloragеæ. Herbs, often aquatic. Flowers small, hermaphrodite or unisexual. Petals 4, fewer or 0. Stamens definite. Ovary inferior, 1–4-celled; ovules solitary, or few definite.

Cohort XII. Myrtales. Flowers regular or subregular, usually hermaphrodite. Pistil syncarpous, inferior (or free in some *Rhizophoraceæ*); style 1 (4 in *Anisophyllea*). Leaves simple.

LIV. Rhizophoraceæ. Usually littoral trees or shrubs. Leaves opposite, stipulate (alternate, exstipulate in *Anisophyllea*). Flowers regular, hermaphrodite. Calyx-lobes valvate. Ovary 2–5-celled, inferior or superior.

LV. Combretaceæ. Trees or shrubs. Leaves opposite or alternate. Stamens definite. Ovary inferior, 1-celled.

LVI. Myrtaceæ. Trees or shrubs. Leaves opposite or alternate, entire. Flowers regular or subregular, hermaphrodite or polygamous. Stamens ∞, perigynous. Ovary inferior, 2–5-celled; ovules 2–∞.

LVII. Melastomaceæ. Herbs, shrubs or trees. Leaves opposite, usually 3–5-nerved. Flowers regular, hermaphrodite. Stamens usually twice as many as petals; anthers

usually appendaged and dehiscing by pores. Ovary adnate to calyx-tube or free, 2–∞-celled, ovules indefinite (ovary 1-celled in *Memecylon*).

LVIII. LYTHRACEÆ. Herbs, shrubs or trees. Calyx-lobes valvate, often alternating with intermediate or external teeth. Petals often crumpled. Stamens definite. Ovary free (except in last three genera, p. 465), 2-∞-celled; ovules rarely definite.

LIX. ONAGRARIEÆ. Herbs or shrubs. Flowers regular. Calyx-lobes valvate. Petals imbricate. stamens iso- or diplostemonous. Ovary inferior, 4–2-celled. Ovules indefinite or solitary, axile.

COHORT XIII. PASSIFLORALES. Flowers regular or irregular. Stamens perigynous (or hypogynous in some *Passifloreæ*). Pistil syncarpous; ovary free or adnate, 1-celled with parietal placentation, or 3-celled with axile placentation.

LX. SAMYDACEÆ. Trees or shrubs. Leaves alternate, often with translucent dots or lines. Flowers small, regular, hermaphrodite. Stamens definite or indefinite. Ovary free or ½-inferior, sessile, 1-celled.

LXI. LOASACEÆ (*Kissenia*). Bristly undershrub. Flowers regular, hermaphrodite. Petals 10, biseriate. Stamens indefinite, perigynous. Ovary inferior, 3-celled. Ovules solitary.

LXII. TURNERACEÆ (*Wormskioldia*). Herbs. Flowers regular, hermaphrodite. Petals 5. Stamens 5. Ovary superior, 1-celled, ovules indefinite.

LXIII. PASSIFLOREÆ. Herbs, climbers with axillary tendrils, or trees. Flowers regular, hermaphrodite or unisexual. Petals 5. Stamens 5 or ∞, hypogynous or perigynous. Ovary free, often stipitate, 1-celled with ∞ ovules on 3 parietal placentas. Seeds albuminous.

LXIV. CUCURBITACEÆ. Usually climbing herbs with tendrils. Flowers unisexual. Petals 5 (3–6), free or connate. Stamens 3 (2–5), anther-cells straight curved or plicate. Ovary inferior, placentas confluent and often reflexed from the axis.

LXV. BEGONIACEÆ. Usually succulent herbs. Leaves unequal-sided. Flowers unsymmetrical, unisexual. Perianth polyphyllous of 2 or more leaves, 2 outer opposite, valvate. Stamens ∞. Ovary inferior, 2–3–4-celled; ovules ∞ ∞ in projecting simple or bifid axile placentas; stigmas often spirally papillose.

COHORT XIV. FICOIDALES. Flowers regular or nearly so. Ovary syncarpous (except *Gisekia*), free or wholly or partially adnate; placentation various. Embryo usually curved.

LXVI. CACTACEÆ (*Rhipsalis*). Fleshy shrub with elongate cylindrical (or angular) pendent branches; leaves squamiform. Petals 6–10. Stamens about 20. Ovary inferior, 1-celled.

LXVII. FICOIDEÆ. Herbs or undershrubs. Leaves entire. Flowers regular, usually hermaphrodite. Sepals or calyx-lobes 4–5. Petals 0 or minute or ∞. Stamens hypogynous or perigynous, definite or indefinite. Ovary various. Seeds albuminous, embryo curved or peripherical.

FLORA OF TROPICAL AFRICA.

Order XLVII. **LEGUMINOSÆ.**

Flowers irregular or regular, usually hermaphrodite. Calyx gamosepalous 5-toothed or -lobed or 2 or more teeth connate, rarely polysepalous. Corolla of 5 rarely fewer petals, usually irregular and imbricate in Suborders 1 and 2, regular and valvate in 3. Stamens 10 rarely fewer or indefinite, perigynous or subhypogynous. Pistil 1-carpellary, ovary free with 1 or more ovules on the ventral suture; style simple. Fruit a legume dehiscing by both sutures, more rarely follicular or indehiscent. Seed exalbuminous or albuminous especially in genera of Suborder 2.—Herbs, shrubs, or trees. Leaves alternate with few exceptions, usually stipulate, compound 1–∞-foliolate, or rarely simple. Inflorescence various.

The second largest Natural Order of flowering plants, generally distributed over the globe.

Suborder I. Papilionaceæ. (By Mr. J. G. Baker.)

Flowers irregular, rarely subregular; hermaphrodite. Calyx gamosepalous 5-toothed or -lobed, or 2 upper lobes more or less connate, or bilabiate 2 upper lobes opposed to the 3 lower; rarely closed in bud and spathaceous. Corolla papilionaceous, or rarely nearly regular; petals 5 free or adnate below to the staminal tube; posterior (*standard*) outside in bud, 2 lateral (*wings*) intermediate, 2 lower inside and usually coherent by their lower margins (*keel*). Stamens perigynous or subhypogynous, 10, diadelphous monadelphous or free (in § *Swartzieæ* ∝). Ovary of the order. Embryo usually with an inflexed radicle, the cotyledons accumbent.—Herbs, shrubs, or trees, sometimes scandent. Leaves alternate, digitate or pinnate, more rarely 1-foliolate or simple. Inflorescence various.

Ninety-one genera of this suborder are tropical African; of these but 9 are peculiar to this Flora.

Tribe 1. **Genisteæ.**—*Stamens* 10, *monadelphous, the anthers usually of two kinds. Pod two-valved, not articulated. Erect herbs or shrubs, with simple or digitately trifoliolate leaves. Leaflets entire.*

Tube of stamens slit along the top.

Calyx with the four upper teeth more or less connate . . . . . 1. Lotononis.

Calyx deeply five-cleft.
Style straight.
Pod lanceolate, inflated . . . . . 2. ROTHIA.
Pod linear, compressed . . . . . 5. ARGYROLOBIUM.
Style abruptly bent near the base . . . . . 3. CROTALARIA.
Tube of stamens not slit along the top.
Calyx-teeth much exceeding the tube.
Wings connate at the apex; keel rostrate . . . . . 4. LUPINUS.
Wings free; keel obtuse . . . . . 5. ARGYROLOBIUM.
Calyx-teeth shorter than the tube . . . . . 6. ADENOCARPUS.

TRIBE 2. **Trifolieæ.**—*Stamens* 10, *diadelphous* (*monadelphous in* Ononis); *anthers uniform* (*except in* Ononis). *Pod two-valved, not articulated. Erect often annual herbs, with three sessile or stalked toothed leaflets.*

Stamens monadelphous; anthers dimorphous . . . . . 7. ONONIS.
Stamens diadelphous; anthers uniform.
Petals quite free from the staminal column.
Pod usually linear, many-seeded (rarely oblong, few-seeded).
Pod linear, straight . . . . . 8. PAROCHETUS.
Pod linear, falcate, rarely oblong, straight . . . . 9. TRIGONELLA.
Pod linear, falcate or usually spirally twisted . . . . 10. MEDICAGO.
Pod roundish, 1–2-seeded . . . . . 11. MELILOTUS.
Petals adnate to the staminal tube . . . . . 12. TRIFOLIUM.

TRIBE 3. **Loteæ.**—*Stamens monadelphous or diadelphous; anthers uniform. Pod two-valved* (*exceptionally indehiscent*), *not articulated. Erect herbs or undershrubs, with imparipinnate leaves and entire leaflets.*

Stamens monadelphous; pod indehiscent.
Pod ovoid, straight, included . . . . . 13. ANTHYLLIS.
Pod linear, falcate, exserted . . . . . 14. HELMINTHOCARPUM.
Stamens diadelphous; pod two-valved . . . . . 15. LOTUS.

TRIBE 4. **Galegeæ.**—*Stamens monadelphous or diadelphous; anthers usually uniform. Pod two-valved* (*exceptionally indehiscent*), *not articulated. Erect, rarely climbing herbs, shrubs or trees, with imparipinnate or exceptionally simple entire leaves.*

Anthers apiculate.
Calyx-teeth long; hairs fixed by the centre.
Stamens monadelphous . . . . . 17. CYAMOPSIS.
Stamens diadelphous . . . . . 18. INDIGOFERA.
Calyx-teeth very short; hairs basifixed . . . . . 21. MUNDULEA.
Anthers blunt.
Pod indehiscent.
Pod one-seeded; leaves gland-dotted . . . . . 16. PSORALEA.
Pod many-seeded; leaves not gland-dotted.
Pod membranous, inflated, entire . . . . . 26. COLUTEA.
Pod compressed; sutures toothed . . . . . 27. BISERRULA.
Pod subligneous, ultimately dehiscing.
Calyx-teeth obsolete or very short . . . . . 22. MILLETIA.
Calyx bilabiate, the upper lip very large . . . . . 23. PLATYSEPALUM.
Pod flat, membranous, subindehiscent.
Upper stamen free at base only . . . . . 19. SYLITRA.
Upper stamen free throughout . . . . . 27. LESSERTIA.
Pod herbaceous or membranous, soon dehiscing.
Flowers in leaf-opposed and terminal racemes . . . . 20. TEPHROSIA.
Flowers in axillary racemes.
Calyx-teeth lanceolate.
Leaves simple . . . . . 24. MICROCHARIS.

Leaflets numerous . . . . . 28. ASTRAGALUS.
Calyx-teeth very short . . . . . 25. SESBANIA.

TRIBE 5. **Hedysareæ.**—*Stamens monadelphous or diadelphous; anthers dimorphous or uniform. Pod articulated* (*except in* Pseudarthria). *Herbs or shrubs, usually erect, with imparipinnate or exceptionally abruptly pinnate leaves.*

Leaves without stipellæ.
Stamens diadelphous.
Filaments dilated upwards.
Pod echinate; leaves simple . . . . . 30. SCORPIURUS.
Pod smooth; leaves pinnate . . . . . 31. ORNITHOPUS.
Filaments filiform.
Pod compressed laterally.
Leaflets numerous; pod one-jointed . . . . . 33. ONOBRYCHIS.
Leaflets 1–3; pod 2–3-jointed . . . . . 31. TAVERNIERA.
Pod terete . . . . . 34. ALHAGI.
Stamens monadelphous.
Leaflets four, opposite . . . . . 41. ARACHIS.
Leaflets three . . . . . 40. STYLOSANTHES.
Leaflets two or 4 digitate . . . . . 42. ZORNIA.
Stamens diadelphous (in two sets of five each).
Calyx bilabiate.
Pod much exserted . . . . . 37. ÆSCHYNOMENE.
Pod not exserted.
Bracteoles minute . . . . . 38. SMITHIA.
Bracteoles very large . . . . . 39. GEISSAPSIS.
Calyx five-toothed.
Pod straight . . . . . 35. ORMOCARPUM.
Pod circinate . . . . . 36. HERMINIERA.
Leaves stipellate.
Pod not articulated . . . . . 44. PSEUDARTHRIA.
Pod articulated.
Pod bent back, included in the calyx . . . . . 45. URARIA.
Pod compressed, straight; calyx herbaceous . . . . . 43. DESMODIUM.
Pod subterete, straight; calyx glumaceous . . . . . 46. ALYSICARPUS.

TRIBE 6. **Vicieæ.**—*Stamens usually diadelphous. Anthers uniform. Pod two-valved, not articulated. Scandent herbs* (*rarely shrubs*) *with abruptly pinnate leaves ending in a tendril or bristle. Leaflets entire, or in* Cicer *dentate.*

Herbs with 10 stamens.
Leaflets dentate . . . . . 47. CICER.
Leaflets entire.
Tube of stamens oblique at the mouth . . . . . 48. VICIA.
Tube of stamens truncate at the mouth . . . . . 49. LATHYRUS.
Shrubs with 9 stamens . . . . . 50. ABRUS.

TRIBE 7. **Phaseoleæ.**—*Stamens diadelphous or monadelphous. Anthers usually uniform. Pod two-valved, not articulated. Scandent, rarely erect, herbs with pinnately trifoliolate leaves.*

Style bearded or penicillate at the apex.
Keel twisted spirally.
Style hooded at the apex . . . . . 62. PHYSOSTIGMA.
Style not hooded . . . . . 63. PHASEOLUS.
Keel not spiral.
Stigma oblique.
Pod many-seeded, not hypogæan.
Pod subterete . . . . . 64. VIGNA.
Pod marked with external transverse lines between the seeds . . . . . 66. PACHYRHIZUS.

Pod 1–2-seeded, thrust below the ground to ripen . . 65. Voandezia.
Stigma terminal.
Bracts large, persistent. . . . . 52. Clitoria.
Bracts minute, deciduous.
Pod compressed, not winged . . . . . 68. Dolichos.
Pod tetragonous, 4-winged . . . . . 67. Psophocarpus.
Style glabrous.
Nodes of the racemes swollen.
Racemes paniculate . . . . . 58. Spatholobus.
Racemes simple.
Petals subequal.
Pod 1–2-seeded . . . . . 60. Dioclea.
Pod many-seeded.
Upper lip of the calyx the longest . . . . . 61. Canavalia.
Lower lip of the calyx the longest . . . . . 59. Galactia.
Standard much exceeding the wings and keel . . . . 56. Erythrina.
Standard much shorter than the wings and keel . . . 57. Mucuna.
Nodes of the racemes not swollen.
Leaves not gland-dotted.
Flowers large and showy . . . . . 51. Centrosema.
Flowers minute.
Bracts scariose persistent . . . . . 53. Shuteria.
Bracts minute deciduous.
All the anthers fertile . . . . . 54. Glycine.
Alternate anthers abortive . . . . . 55. Teramnus.
Leaves copiously gland-dotted.
Ovules 4 or more . . . . . 69. Cajanus.
Ovules 1–2.
Pod compressed.
Stems twining . . . . . 70. Rhynchosia.
Stems erect . . . . . 71. Eriosema.
Pod turgid . . . . . 72. Flemingia.

Tribe 8. **Dalbergieæ.**—*Stamens monadelphous or diadelphous. Anthers uniform. Pod indehiscent. Erect or scandent shrubs or trees, with imparipinnate leaves and entire leaflets.*

Pod not drupaceous.
Side-leaflets alternate.
Anthers basifixed.
Pod linear or oblong . . . . . 73. Dalbergia.
Pod suborbicular . . . . . 74. Ecastaphyllum.
Anthers versatile.
Calyx campanulate. Pod falcate . . . . . 75. Drepanocarpus.
Calyx turbinate. Pod suborbicular oblique . . . . 76. Pterocarpus.
Side-leaflets opposite.
Wings free from the keel . . . . . 77. Ostryocarpus.
Wings adnate to the keel.
Pod not winged . . . . . 78. Lonchocarpus.
Pod winged . . . . . 79. Derris.
Pod drupaceous . . . . . 80. Andira.

Tribe 9. **Sophoreæ.**—*Stamens* 10, *free. Anthers uniform. Pod not articulated, indehiscent or two-valved. Trees or shrubs, erect or scandent, with simple or digitately trifoliolate or imparipinnate leaves with entire leaflets.*

Leaves simple.
Pod sessile; anthers shorter than filaments.
Bracteoles large, persistent . . . . . 81. Dalhousiea.
Bracteoles smaller; deciduous . . . . . 82. Baphia.
Pod long-stalked; anthers exceeding filaments . . . . 83. Leucomphalus.

Leaves digitately trifoliolate . . . . . 84. Camoensia.
Leaves imparipinnate.
  Corolla papilionaceous.
    Pod flattish, membranous . . . . . 85. Calpurnia.
    Pod turgid moniliform . . . . . 86. Sophora.
    Pod coriaceous, not moniliform . . . . . 87. Ormosia.
  Petals uniform . . . . . 88. Cadia.

Tribe 10. **Swartzieæ.**—*Stamens indefinite. Petals* 6, 1, *or* 0. *Trees or shrubs. Leaves simple or imparipinnate. Leaflets entire.*

Stamens inserted at the base of the calyx.
  Petals 6 . . . . . 89. Baphiopsis.
  Petal solitary . . . . . 90. Swartzia.
Stamens inserted half-way up the calyx.
  Petals none . . . . . 91. Cordyla.

1. LOTONONIS, DC.; Benth. et Hook. f. Gen. Pl. i. 476.

Calyx turbinate, the four upper teeth often more or less connate. Standard oblong; keel bluntly upcurved: wings much shorter and smaller. Stamens all connate in a tube slit along the top; anthers alternately shorter and versatile, longer and basifixed. Pod linear-oblong or linear, compressed or turgid, many-seeded, continuous within. —Herbs or undershrubs with digitately trifoliolate leaves.

A large genus almost confined to the Cape.

Flowers subsessile in the axils of the leaves.
  Standard exceeding the keel . . . . . 1. *L. tenuis.*
  Keel exceeding the standard.
    Keel equalling the calyx . . . . . 2. *L. Leobordea.*
    Keel distinctly exserted . . . . . 3. *L. clandestina.*
Flowers in many-flowered congested racemes.
  Stipules foliaceous . . . . . 4. *L. Bainesii.*
  Stipules linear . . . . . 5. *L. angolensis.*

1. **L. tenuis,** *Baker*. A copiously branched diffuse annual half a foot high with slender thinly grey-silky branches. Stipules setaceous, very minute. Leaflets linear, the central one 6–10 lines long, $\frac{1}{2}$–$\frac{3}{4}$ line broad, acute, the lateral ones very much shorter, inconspicuously grey-silky. Flowers 1–2 on very short pedicels in the axils of the leaves. Calyx $\frac{1}{8}$ in. long, thinly grey-silky, the five teeth distinct, the lower three linear, as long as the tube, the two upper ones lanceolate, shorter. Corolla yellowish, the standard slightly exceeding the keel, which slightly exceeds the calyx. Pod linear, 5–6 lines long, 1 line broad, upcurved, turgid, slightly torulose, 21–24-seeded, inconspicuously grey-silky.

Lower Guinea. Angola; Mossamedes in sandy ground by the river Beco, *Dr. Welwitsch!*

Very different in habit from any other species.

2. **L. Leobordea,** *Benth. in Lond. Journ. Bot.* 2, 607. Stems under six inches long, procumbent, copiously and diffusely branched, herbaceous, clothed like the rest of the plant with yellowish silky pubescence. Stipules lanceolate, $\frac{1}{8}$ in. Petiole $\frac{1}{8}$–$\frac{1}{4}$ in. Leaflets 3,

sessile, linear or oblanceolate, about ½ in. long, ⅛ in. broad, apex slightly rounded mucronate. Flowers in sessile clusters of 2–5 each in the axils of the leaves. Calyx 2–2½ lines long, between tubular and campanulate, the upper teeth lanceolate-acuminate, reaching about half way down, the lowest setaceous. Corolla pale yellow, the keel about equalling the calyx. Pod linear-oblong, turgid, about equalling the calyx.—Harv. Fl. Cap. ii. 61; *L. platycarpos*, Viv. Pl. Ægypt. dec. 4, 14; *Leobordea lotoides*, Delile, Frag. Pl. Arab. 23, fig. 1; *L. persica* and *sphærosperma*, Spach. Ann. Sc. Nat. xix. 235; *Xerocarpus abyssinicus*, Schweinf. Fl. Æthiop. 21; *Leobordea abyssinica*, Hochst. in Hb. Schimp. Abyss.

Nile Land. Abyssinia, *Schimper!*
A desert species, extending to Egypt, Persia, Beloochistan, and the Cape.

3. **L. clandestina,** *Benth. in Harv. Fl. Cap.* ii. 61. A diffuse copiously di- or trichotomously branched annual with finely silky stems under a foot long. Stipules foliaceous, linear or oblanceolate, 3–4 lines long, deciduous. Petioles 3–6 lines long. Leaflets oblanceolate, silky, 4–8 lines long, bluntish with a faint mucro. Flowers 2–6 in subsessile umbels in the axils of the leaves. Pedicels very short. Calyx densely grey-silky, 4 lines long, the 4 upper teeth linear, shorter than the tube, the lowest tooth deeper linear-setaceous. Corolla yellowish, only the silky, densely villose keel distinctly exserted. Pod linear, 4–4½ lines long, 1 line broad, turgid, straight, glabrescent, 10–12-seeded.

Lower Guinea. Benguella in the sands of the seashore, *Dr. Welwitsch!*
South Central. In the interior near the Tropic, *Chapman and Baines!*
Also a Cape species.

4. **L. Bainesii,** *Baker.* Stem under a foot long, slender, procumbent, herbaceous, irregularly branched, quite glabrous. Stipules 2–2½ lines long, cordate-ovate acuminate, unequal-sided. Petioles ¼ in. glabrous. Leaflets 3, sessile, linear, the central one ½–⅝ in. long, ⅛ in. broad, base narrowed, point slightly rounded mucronate, glabrous. Flowers in dense umbellate heads of 8–10 each on leaf-opposed glabrous peduncles an inch long. Bracts inconspicuous. Calyx subsessile, infundibuliform, ⅛ in. deep, slightly silky, teeth very short, subdeltoid. Corolla reddish, three times as long as the calyx, the keel and standard subequal, the wings small and shorter. Pod not seen.

South Central. In the interior near the Tropic of Capricorn, *Chapman and Baines!*

Belongs to the section *Polylobium* of Harvey. Very near the Cape *L. umbellata* in general habit, bracts, and stipules, differing by its narrower leaves, want of pubescence, and very short calyx-teeth.

5. **L. angolensis,** *Welw. mss.* A copiously-branched glabrous perennial herb with trailing stems more than a foot long. Stipules linear, 2–3 lines, moderately persistent. Petioles 3–12 lines. Leaflets 3, subsessile, oblanceolate, glabrous, the central one 6–12 lines long,

bluntish with a faint mucro. Flowers 6–18 in dense racemes on leaf-opposed peduncles 6–36 lines long. Pedicels ½–1 line long, with a minute linear bracteole. Calyx ⅛ in., turbinate, glabrous, the 4 upper teeth lanceolate-deltoid, shorter than the tube, the lowest narrower. Corolla pale yellow, twice the calyx, the standard ovate-acuminate, the keel-petals 1 line broad. Pod linear, compressed, 6–8 lines long, ⅛ in. broad, upcurved, glabrous, 15–20-seeded.

Lower Guinea. Angola; Huilla and Pungo Andongo, *Dr. Welwitsch!*
Identical with the last in general habit; differing principally in the stipules and calyx-teeth.

2. **ROTHIA,** Pers.; Benth. et Hook. f. Gen. Plant. i. 477.

Calyx deeply 5-cleft, with subequal divisions. Standard spathulate in our species; wings narrow; keel-petals scarcely adhering to one another. Stamens united in a tube slit above; anthers small, uniform. Ovary sessile, multiovulate; style straight glabrous; stigma capitate. Pod lanceolate, falcate, inflated, dehiscing by the upper suture.—Annual diffuse herbs.

Two closely allied species, the other inhabiting India and Tropical Australia. The genus forms an exception to the rest of the Tribe by its uniform anthers.

1. **R. hirsuta,** *Baker.* A diffusely branched annual about half a foot high, the branches densely clothed with long silky grey pubescence. Petioles 3 lines. Leaflets 3, subsessile, oblanceolate, 6–9 lines long, acute, both sides silky. Flowers 2–5 on short pedicels, sessile or nearly sessile from the axils of the leaves. Calyx silky, 2–2½ lines deep, the lanceolate teeth reaching more than halfway down. Corolla whitish-violet not exserted. Pod sessile, ½ in. long, very silky, many-seeded.—*Xerocarpus hirsutus,* Guill. et Perr. Fl. Seneg. 169. t. 44.

Upper Guinea. Senegal, *Perrottet!*
Nile Land. Abyssinia, *Schimper!* Nubia, *teste Bentham.*
Lower Guinea. Huilla, Angola, 5500 ft. *Dr. Welwitsch!*

3. **CROTALARIA,** Linn.; Benth. et Hook. f. Gen. Pl. i. 479.

Calyx with a campanulate tube and five distinct equal or subequal teeth. Petals subequal; standard orbicular or ovate with a short claw; keel distinctly suddenly or gradually rostrate, much upcurved. Ovary sessile or stalked, bi- or multi-ovulate; style abruptly bent upwards near the base, bearded along the inner side. Stamens united in a tube slit along the top; anthers dimorphous. Pod sessile or distinctly stalked, round, oblong, or linear, continuous within, turgid.—Herbs or shrubs with simple or digitately trifoliolate (in one Trop. African species multifoliolate) leaves. Flowers in racemes sometimes congested, terminal or leaf-opposed or rarely in the axils of the leaves. Bracts and stipules usually minute, setaceous.

A large genus spread throughout the Tropical regions of both hemispheres, with its head-quarters in Tropical Africa. Several species extend to the Cape.

A. Leaves simple.

GROUP 1. **Simplicifoliæ.**

Rigid copiously-branched shrubs.
Pods 2–3-seeded . . . . . 1. *C. thebaica*
Pods 6–8-seeded . . . . . 2. *C. arenaria.*
Herbs or laxly-branched undershrubs.
Stems and leaves glabrous or subglabrous.
Stipules minute, setaceous.
Leaves linear.
Stems terete.
Corolla slightly exceeding the calyx . . . . . 3. *C. glauca.*
Corolla three times the calyx . . . . . 4. *C. spartea.*
Stems winged.
Narrowly 4-winged, leaves numerous . . . . . 5. *C. stenoptera.*
Broadly 2-winged, leaves few or none . . . . . 6. *C. holoptera.*
Leaves oblanceolate.
Flowers solitary . . . . . 7. *C. uniflora.*
Flowers racemose . . . . . 8. *C. retusa.*
Leaves oblong, acute . . . . . 9. *C. Welwitschii.*
Stipules foliaceous, persistent . . . . . 10. *C. verrucosa.*
Stems and leaves conspicuously downy or silky.
Corolla 1½–2 times the calyx.
Pod stalked . . . . . 11. *C. Vogelii.*
Pod sessile.
Pod 5–6 times the calyx . . . . . 12. *C. Leprieurii.*
Pod 1½ times the calyx.
Pod glabrous, 8–9-seeded . . . . . 13. *C. polygaloides.*
Pod pubescent, 1–2 seeded . . . . . 14. *C. cylindrostachys.*
Corolla equalling or scarcely exceeding calyx.
Pod glabrous, 12–18-seeded . . . . . 15. *C. calycina.*
Pod silky, 2–3-seeded . . . . . 16. *C. anthyllopsis.*

B. Leaves digitately trifoliolate.

GROUP 2. **Oliganthæ.**—*Pods round or oblong. Flowers scattered* 1–4 *together, lateral, very rarely terminal.*

Very diffuse annual herbs.
Pods small round sessile.
Glabrous, leaves subsessile . . . . . 17. *C. microcarpa.*
Downy, leaves stalked . . . . . 18. *C. pisicarpa.*
Pods short-stalked small oblong . . . . . 19. *C. microphylla.*
Pods distinctly stalked, large, oblong.
Silky, leaflets oblanceolate, flowers 2–3 together . . . . 20. *C. podocarpa.*
Glabrous, leaflets linear, flowers solitary . . . . . 21. *C. polyclados.*
A robust diffuse usually spinose annual . . . . . 22. *C. spinosa.*
Unarmed shrubs.
Leaves subsessile, stipules 0.
Pod small, hard, round, 3–4-seeded . . . . . 23. *C. cistoides.*
Pod oblong, 15–18-seeded . . . . . 24. *C. caudata.*
Leaves distinctly-stalked, distinctly stipulate.
Pubescent, leaflets oblanceolate, blunt, 4–6 lines long . . 25. *C. Forbesii.*
Pubescent, leaflets obovate, blunt, 12–16 lines long . . . 26. *C. variegata.*
Glabrous, leaflets linear, acute . . . . . 27. *C. ervoides.*

GROUP 3. **Chrysocalycinæ.**—*Pods small, round or oblong. Flowers in dense round or oblong terminal heads.*

Leaves sessile or subsessile.
Shrubby, leaves crowded. . . . . 28. *C. abscondita.*
Herbaceous, leaves scattered.
Pod round, 3–4-seeded.
Leaflets linear . . . . . 29. *C. Perottetii.*

Leaflets oblanceolate . . . . . 30. *C. gracilis.*
Pod oblong, 6–8-seeded.
Calyx-teeth 2½–3 lines broad . . . . . 31. *C. macrocalyx.*
Calyx-teeth 1 line broad . . . . . 32. *C. ebenoides.*
Leaves distinctly stalked.
Fruticose or suffruticose.
Leaflets an inch broad, densely brown-silky beneath . . 33. *C. densicephala.*
Leaflets ¼ inch broad, inconspicuously grey-downy . . . 34. *C. nigricans.*
Herbaceous.
Heads shortly peduncled.
Leaflets 3–4 lines broad, pod 8–10-seeded . . . . . 35. *C. atrorubens.*
Leaflets 8–12 lines broad, pod 3–4-seeded . . . . . 36. *C. dumetorum.*
Heads sessile, very dense.
Corolla red, pod 8–10-seeded . . . . . 37. *C. ononoides.*
Corolla yellow, pod 2-seeded . . . . . 38. *C. cephalotes.*

Group 4. **Sphœrocarpæ.**—*Annuals with small round sessile few-seeded pods and small copiously racemose flowers.*

Racemes both lateral and terminal.
Leaflets linear, seeds 4–6 . . . . . 39. *C. nubica.*
Leaflets oblanceolate, seeds 2–4 . . . . . 40. *C. sphærocarpa.*
Racemes terminal only, not prolonged into the axils of the upper leaves.
Pods distinctly stalked, pedicels cernuous . . . . . 41. *C. nutans.*
Pods sessile, pedicels rigidly erecto-patent.
Corolla turning black, the standard densely argenteous on the back . . . . . 42. *C. filicaulis.*
Corolla not turning black, 3 lines long, the standard glabrous on the back . . . . . 43. *C. tenuirama.*
Corolla not turning black, 2 lines long, the standard thinly brown-silky on the back . . . . . 44. *C. hyssopifolia*
Racemes terminal only, prolonged into the axils of the upper leaves.
Leaflets of upper leaves a line or less broad.
Corolla ⅛ inch long, dull greenish-yellow . . . . . 45. *C. parvula.*
Corolla 3–4 lines long, bright yellow, veined with red . . 46. *C. erythrophleba.*
Leaflets of upper leaves 3–6 lines broad . . . . . 47. *C. prolongata.*

Group 5. **Oocarpæ.**—*Herbs or shrubs with elongated racemes and large oblong or rounded pods, not more than twice as long as broad.*

Pods distinctly stalked.
Fruticose.
Pod glabrous, oblong; stems and leaves silvery . . . . 48. *C. argyræa.*
Pod oblong; stems finely grey-downy . . . . . 49. *C. ivantulensis.*
Pods densely silky.
Pod subglobose, 4 lines long . . . . . 50. *C. ramosissima.*
Pods oblong, 12–15 lines long.
Leaves sessile; stipules minute setaceous . . . . 51. *C. amœna.*
Leaves long-stalked: stipules large, adnate to the petiole . . . . . 52. *C. cordata.*
Herbaceous.
Bracts large cordate-ovate . . . . . 53. *C. orixensis*
Bracts minute, setaceous.
Stipules setaceous, 3–4 lines long . . . . . 54. *C. versicolor.*
Stipules 0, or very minute.
Pod an inch long . . . . . 55. *C. Doniana.*
Pod half an inch long . . . . . 56. *C. Onobrychis.*
Pods subsessile or sessile.
Stipules semilunate, 3–6 lines long, persistent.

Herbaceous; calyx 3–4 lines; pods glabrescent.
Pubescence of stem short, racemes terminal . . . . 57. *C. goreensis.*
Pubescence of stem brown, spreading, racemes lateral . 58. *C. flexuosa.*
Shrubby; calyx 8–2 lines, pod velvety . . . . . 59. *C. elata.*
Stipules none, or very minute, setaceous, deciduous.
Fruticose.
Racemes distinctly peduncled . . . . . 60. *C. orthoclada.*
Racemes extending into the axils of the leaves.
Pod oblong, compressible, 4–6-seeded . . . . . 61. *C. virgatula.*
Pod round, hard, 1-seeded . . . . . 62. *C. florida.*
Herbaceous.
Calyx-teeth deltoid, equal to the tube . . . . . 63. *C. Steudneri.*
Calyx-teeth lanceolate, exceeding the tube.
Racemes all terminal . . . . . 64. *C. maxillaris.*
Racemes both lateral and terminal . . . . . 65. *C. senegalensis.*

Group 6. **Cylindrocarpæ.**—*Pod linear or linear-oblong,* 12–30-seeded. (*Flowers racemose, except sometimes in* C. lotifolia.)

Racemes terminal only or both terminal and lateral.
Stem and young leaves clothed with (comparatively long) spreading hairs.
Stipules setaceous.
Corolla scarcely as long as the calyx . . . . . 66. *C. montana.*
Corolla half as long again as the calyx.
Calyx ¼ inch long . . . . . 67. *C. incana.*
Calyx 6–9 lines long.
Shrubby with obovate blunt leaflets . . . . . 68. *C. Grantii.*
Herbaceous with ovate acute leaflets . . . . . 69. *C. Stewartii.*
Stipules foliaceous, semilunate.
Pod distinctly stalked; lateral racemes numerous . . 70. *C. fulgida.*
Pod sessile; lateral racemes few or none.
Suffruticose with flowers an inch long . . . . . 71. *C. lachnocarpa.*
A decumbent herb with flowers ½ inch long . . . . 72. *C. decumbens.*
Stems and leaves beneath shortly grey-downy.
Herbaceous.
Pod distinctly-stalked, 12–15 lines long, 20–30-seeded . 73. *C. uncinata.*
Pod sessile, 6–7 lines long, 12–15-seeded . . . . . 74. *C. comosa.*
Suffruticose or fruticose.
Stipules foliaceous semilunate . . . . . 75. *C. natalitia.*
Stipules 0 or minute setaceous.
Calyx-teeth oblanceolate, spathulate cuspidate . . . 76. *C. platysepala.*
Calyx-teeth lanceolate.
Leaflets oblanceolate, ¼–⅜ inch broad . . . . . 77. *C. emarginata.*
Leaflets oblong, an inch broad . . . . . 78. *C. protensa.*
Calyx-teeth deltoid . . . . . 79. *C. zanzibarica.*
Mature stem and leaves beneath subglabrous.
Calyx-teeth shorter than the tube.
Corolla 3–4 lines long.
Leaflets linear, 1–4 inches long.
Calyx-teeth linear; petiole ¼–½ inch . . . . . 80. *C. lathyroides.*
Calyx-teeth deltoid mucronate; petiole 1–2 inches . 81. *C. lanceolata.*
Leaflets oblanceolate, ½ inch long . . . . . 82. *C. tigrensis.*
Corolla 6–7 lines; leaflets linear . . . . . 83. *C. Kirkii.*
Corolla 7–9 lines long.
Pod half an inch thick . . . . . 84. *C. intermedia.*
Pod ¼–⅜ inch thick.
Keel much curved . . . . . 85. *C. ochroleuca.*
Keel little curved . . . . . 86. *C. brevidens.*
Calyx-teeth equalling or exceeding the tube.
Pod distinctly-stalked.

Pod glabrous within.
Racemes elongated, many-flowered.
Shrubby, stipules obovate, large, persistent . . 87. *C. capensis.*
Shrubby, stipules setaceous, deciduous . . . . 88. *C. striata.*
Herbaceous, stipules linear.
Leaflets 12–18 lines broad . . . . . 89. *C. glaucifolia.*
Leaflets 3–6 lines broad . . . . . 90. *C. Lotononis.*
Racemes 4–6-flowered . . . . . 91. *C. cyanea.*
Pod full of wool within . . . . . 92. *C. lupinoides.*
Pod sessile or subsessile.
Stipules semilunate, persistent . . . . . 93. *C. cylindrocarpa.*
Stipules linear, ¼ inch, persistent . . . . . 94. *C. recta.*
Stipules 0 or minute setaceous deciduous.
Suffruticose with obovate leaflets.
Petioles an inch long . . . . . 95. *C. falcata.*
Petioles 1½–3 inches long . . . . . 96. *C. fertilis.*
Herbaceous; leaflets oblanceolate or linear.
Bracts 3–4 lines long . . . . . 97. *C. Dilloniana.*
Bracts very minute.
Calyx-teeth deltoid or lanceolate-acuminate 98. *C. oligostachya.*
Calyx-teeth linear . . . . . 99. *C. Plowdeni.*
Racemes all lateral.
Flowers 1–4, in axillary racemes or umbels . . . . . 100. *C. lotifolia.*
Flowers in stalked leaf-opposed racemes.
Pod distinctly-stalked; flowers 3–6 in a raceme.
Upper calyx-teeth 4 lines broad . . . . . 101. *C. platycalyx.*
Upper calyx-teeth ⅛ inch broad . . . . . 102. *C. Quartiniana.*
Pod sessile; racemes many-flowered.
Fruticose, with silky leaves . . . . . 103. *C. polysperma.*
Herbaceous, with subglabrous leaves.
Racemes 6–12-flowered . . . . . 104. *C. astragalina.*
Racemes 20–50-flowered . . . . . 105. *C. pycnostachya.*

C. Leaves digitately 5–7-foliolate.

Group 7. **Multifoliolatæ.**—(The only tropical African species) . . . . . 106. *C. cleomifolia.*

1. **C. thebaica,** *DC. Prod.* ii. 128. Shrubby, a foot or more high, very diffuse, branches stiff, grey downy, many of the lower ones spinose. Leaves simple, sessile, oblong, coriaceous, undulated, 3–6 lines long, blunt, both sides silky. Racemes few-flowered, terminal and lateral. Calyx 2 lines, the linear teeth exceeding the tube. Corolla pale yellow, scarcely exceeding the calyx. Pod twice the calyx, oblong, pubescent, sessile, 2–3-seeded.—*Spartium thebaicum,* Delile, Fl. Ægypt. 107. t. 37. fig. 1.

Nile Land. Nubia, *Kotschy! Ehrenberg,* and others.
Frequent in the desert lower down the river.

2. **C. arenaria,** *Benth. in Lond. Journ. Bot.* ii. 474. Stems shrubby, prostrate, not more than a foot long, very copiously branched, densely grey-villose. Leaves sessile, simple, oblong, 3–4 lines long by more than half as broad, subcoriaceous, both sides densely silky. Flowers 4–8 in lax short-stalked racemes. Calyx 2½ lines deep, densely tawny-silky, teeth linear, reaching down nearly to the base. Corolla pale yellow, about equalling the calyx. Pod 5–6 lines long, half as thick,

oblong, sessile, densely tawny-silky, 6–10-seeded.—*C. thebaica*, Guill. et Perr. Fl. Seneg. i. 160, *non* DC.

Upper Guinea. Senegambia, *Perrottet! Roger!*
Very similar to the last in general habit, but not spinose.

3. **C. glauca,** *Willd.; DC. Prod.* ii. 127. An erect glabrous annual 1–3 feet high with slender erecto-patent terete branches. Stipules setaceous, 2–3 lines. Leaves linear, nearly sessile, 1–3 in. long, acute, mucronate, subcoriaceous, the primordial ones lanceolate. Flowers in copious 2–8-flowered very lax peduncled terminal and lateral racemes. Bracts minute, setaceous. Pedicels 3–4 lines. Calyx 3 lines, glabrous, the linear-lanceolate teeth reaching more than halfway down. Corolla half as long again as the calyx, the standard very much recurved. Pod linear-oblong, pendulous, 6–12 lines long, 4–5 lines thick, glabrous, distinctly stalked, 8–12-seeded.—*C. acutifolia*, Steud. in Schimp. Pl. Abyss. No. 829; *C. genistifolia*, Schum. et Thonn. Pl. Guin. 335.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius!* Niger country, *Thonning! Vogel! &c.*
Nile Land. Abyssinia, *Schimper!* Unyoro, in plantain-groves, and eaten by the people of Madi as spinach, *Speke and Grant!*
Lower Guinea. Angola, in many localities, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi-land, *Dr. Kirk!*

4. **C. spartea,** *R. Br. mss. in Herb. Mus. Brit.* Stems slender, herbaceous, glabrous, erect, terete, 1–2 ft. high, with numerous long slender ascending branches. Stipules minute, setaceous, deciduous. Upper leaves sessile, linear, 1–3 in. long, 1–3 lines broad, acute, subcoriaceous, glabrous, the lowest lanceolate 5–6 lines broad. Flowers in lax 6–12-flowered terminal racemes reaching 4–5 in. long. Pedicels 2–3 lines long. Bracts minute, setaceous. Calyx glabrous, $\frac{1}{8}$ in., the lanceolate teeth equalling the tube. Corolla 4 lines, the standard purple, 2 lines broad. Pod (not seen mature) linear-oblong, glabrous, sessile, 8–9 lines long, $2\frac{1}{2}$ lines broad, straight, 18–20-seeded.

Upper Guinea. Sierra Leone, *Afzelius!*
Lower Guinea. Huilla, in woody meadows, *Dr. Welwitsch!*

5. **C. stenoptera,** *Welw. mss.* A glabrous annual copiously branched from the crown of the root with suberect simple or once-forked stems more than a foot high with a narrow wing to each of the four angles. Stipules rigid, setaceous, persistent. Leaves subsessile, linear, 1–4 in. long, $1\frac{1}{2}$–6 lines broad, narrowed gradually to a mucronate point, subcoriaceous, pale green. Flowers 3–5 in very lax long-peduncled subsecund terminal racemes. Bracts linear, very minute. Pedicels 3–4 lines, spreading. Calyx glabrous, 3–4 lines long, narrowed at the base, the lanceolate acuminate teeth reaching more than halfway down. Corolla $\frac{1}{2}$ in. long, yellow veined with violet. Pod oblong, inflated, glabrous, $\frac{1}{2}$ in. long, 3–4 lines broad, shortly stalked, 12–15-seeded.

Lower Guinea. Huilla, in woody meadows, *Dr. Welwitsch!*

6. **C. holoptera,** *Welw. mss.* A glabrous rigid annual branched at the crown of the root with suberect 1–3 times dichotomously forked stems with two rigidly coriaceous wings each reaching a breadth of 2–3 lines in the centre of the main stem. Leaves very few, sometimes none, oblong or oblanceolate, 18–21 lines long, 6–8 lines broad, bluntish or subacute, very conspicuously mucronate, rigidly coriaceous, pale green. Flowers 3–4 in lax long-peduncled terminal racemes. Bracts rigid, linear, very minute. Pedicels 3–4 lines long, spreading. Calyx $\frac{1}{4}$ in. long, glabrous, cuneate at the base, the lanceolate acuminate teeth exceeding the tube. Corolla yellow, 5–6 lines long. Pod distinctly stalked, oblong, inflated, 7–10 lines long, 5–6 lines broad, glabrous, very blunt, 10–12-seeded.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 ft., sparingly in sandy thickets, *Dr. Welwitsch!*

7. **C. uniflora,** *Baker.* Stem herbaceous, slender, procumbent, terete, glabrous, branched copiously and diffusely. Stipules minute, setaceous. Leaves simple, sessile, oblanceolate, $\frac{3}{4}$–$\frac{7}{8}$ in. long, $\frac{1}{4}$ in. broad, mucronate, base subcuneate, glabrous. Flowers solitary on leaf-opposed slender glabrous pedicels more than an inch long, with a minute setaceous bract three-quarters of the way up. Calyx glabrous, $\frac{1}{4}$ in. deep, the teeth lanceolate, reaching down nearly to the base. Corolla not seen. Pod linear-oblong, 6–7 lines long, 3 lines thick, glabrous, slightly upcurved, distinctly stalked.

Upper Guinea. Senegambia, *Perrottet!*

8. **C. retusa,** *Linn.; DC. Prod.* ii. 125. Suffruticose, subglabrous, sparingly branched. Stipules minute, setaceous. Leaves simple, oblanceolate, sessile, reaching 18–24 lines long, 6–12 lines broad, retuse, faintly mucronate, both sides subglabrous. Flowers in lax terminal racemes 4–6 in. long. Bracts linear, minute. Pedicels 2–3 lines. Calyx $\frac{3}{8}$–$\frac{1}{2}$ in., the teeth exceeding the tube, the upper ones lanceolate-deltoid, lower narrower. Corolla bright yellow, considerably exceeding the calyx. Pod distinctly-stalked, linear-oblong, glabrescent, $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. thick, 15–20-seeded.—Bot. Mag. t. 2561; Bot. Reg. t. 253.

Upper Guinea. Gaboon country, *Griffon du Bellay and Duparquet, teste Baillon.*

Mozamb. Distr. Zanzibar, *Dr. Peters, Dr. Kirk!*

A common E. Indian and Malayan species very likely only introduced with us.

9. **C. Welwitschii,** *Baker.* A low shrub with slender trailing woody subglabrous branches ascending outwards. Stipules minute, setaceous, moderately persistent. Petioles reaching an inch. Leaves simple, oblong, narrowed gradually to an acute point, glabrous, coriaceous, the upper ones 2–$3\frac{1}{2}$ in. long, 9–18 lines broad. Flowers 4–20 in lax long-peduncled terminal racemes reaching 6–7 in. long, 2 in. broad. Bracts lanceolate, $1\frac{1}{2}$–2 lines, acute, coriaceous, deciduous. Pedicels erecto-patent, 3–6 lines. Calyx $\frac{3}{5}$ in. long, inconspicuously

shortly grey-downy, the lanceolate ultimately reflexed teeth rather exceeding the tube. Corolla red, not conspicuously veined, glabrous, 9–10 lines deep, the standard $\frac{3}{4}$ in. broad, the keel $\frac{1}{4}$ in. deep, moderately incurved, fringed with a dense mass of grey cottony pubescence. Ovary glabrous, linear-oblong, shortly-stalked, 15–20-ovulate. Pod not seen.

Lower Guinea. Pungo Andongo, Angola, at 2400–3800 ft., in sandy meadows, *Dr. Welwitsch!*

10. **C. verrucosa,** *Linn.; DC. Prod.* 2, 125. Stems 2–3 ft. high, erect, copiously divaricately branched, thinly adpressed grey-silky upwards. Stipules large, foliaceous, semi-lunate. Leaves nearly sessile, obovate, 2–5 in. long, by generally more than half as broad, glabrous above, thinly adpressed silky beneath when young. Flowers in lax 6–20-flowered terminal and leaf-opposed racemes on peduncles which about equal them. Bracts small, setaceous, silky. Calyx campanulate, thinly silky, $\frac{1}{4}$ in. deep, teeth lanceolate, reaching three-quarters of the way down. Standard twice as long as the calyx, greenish-white, streaked with pale-blue within; wings obovate, yellowish-white at the base, the rest deep blue; keel whitish-yellow towards the point. Pod 1–$1\frac{1}{2}$ in. long, 4–5 lines thick, narrowed at the base, silky when young, glabrous when mature.—Bot. Mag. t. 3034; *C. cærulea,* Jacq. Ic. Pl. Rar. t. 144.

Upper Guinea. Sierra Leone, *Dr. Welwitsch!* Banks of the Gaboon, *Mylne! Mann! Griffon du Bellay!*

Mozamb. Distr. Zanzibar, *fide Baillon.*

A native both of Tropical Asia and America, and the Mauritius.

11. **C. Vogelii,** *Benth. in Lond. Journ. Bot.* 2, 561. Stems 2–3 ft. high, erect, with numerous erecto-patent branches, covered like the rest of the plant with soft spreading yellowish hairs. Leaves moderately close and numerous, erecto-patent, short-stalked, linear or linear-lanceolate, 1–2 in. long, $\frac{1}{8}$–$\frac{1}{4}$ in. broad, mucronate, both sides downy. Flowers 6–12 in copious lax terminal and lateral racemes. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., slender, silky. Calyx 2 lines deep, silky, teeth reaching two-thirds of the way down, three upper ones shorter and lanceolate, two lower ones longer and linear. Bracts linear, minute. Corolla twice as long as the calyx; standard obovate, yellow, veined with purple; wings narrow, scarcely veined. Pod $\frac{3}{8}$ in. long, linear-oblong, on a short stalk, deciduously silky, 8–12-seeded.

Upper Guinea. Niger country, Stirling on the Quorra, *Vogel!* Nupe, in dry stony soil, *Barter!*

12. **C. Leprieurii,** *Guill. et Perrott. Fl. Seneg.* 168. Stem $1\frac{1}{2}$–2 ft. high, erect, simple, terete, shortly hairy. Leaves short-stalked, simple, linear-lanceolate, 4–5 in. long, hairy on both sides. Flowers in lax racemes. Calyx about a line long, silky, teeth lanceolate, nearly equal. Standard ovate-oblong, subacute, yellow, striated; wings one-half smaller, oblong, obtuse; keel rather longer, yellow. Pod $\frac{1}{2}$ in. long, sessile, about 26-seeded.—Walp. Rep. 1, 590.

Upper Guinea. Senegambia, *Leprieur.* Not seen.

13. **C. polygaloides,** *Welw. mss.* Stem a foot, herbaceous, erect, copiously branched, densely clothed with short grey silky pubescence. Leaves close, subsessile, linear, erecto-patent, 9–18 lines long, 2–2½ lines broad, blunt, narrowed gradually at the base, both surfaces thinly grey-silky, subglaucous beneath. Flowers 10–30 in rather close terminal racemes, the lower ones fascicled and reaching down among the leaves. Bracteoles minute, setaceous. Pedicels ⅛ in. long, thinly silky. Calyx 2–2½ lines long, finely silky, the linear teeth reaching down nearly to the base. Corolla yellowish, half as long again as the calyx, very fugacious. Pod linear-oblong, 3–4 lines long, a line thick, glabrous when mature, slightly recurved, 8–9-seeded.

Upper Guinea. Sierra Leone, *Afzelius!*
Lower Guinea. Angola, Golungo Alto, 1000–2400 ft., *Dr. Welwitsch!*

14. **C. cylindrostachys,** *Welw. mss.* An erect annual 1–2 ft. high, with densely brown-silky stems and several erecto-patent branches overtopping the primary one. Stipules minute, setaceous, moderately persistent. Petioles 2–3 lines, densely silky. Leaves simple, oblong, 1–2 in. long, acute, faintly mucronate, persistently brown-silky on both sides. Flowers up to 40–60 in moderately dense terminal racemes 4–6 in. long, ½ in. broad. Bracts setaceous, 1–2 lines. Pedicels erecto-patent, ⅛ in. densely silky. Calyx turbinate, 1½–2 lines, with two setaceous bracteoles at the base, the lanceolate teeth as long as the tube. Corolla yellow, 3 lines, the standard conspicuously veined with purple. Pod roundish-oblong, sessile, ¼ in. long, densely clothed with a mass of bright light-brown silky hairs, 1–2-seeded.

Lower Guinea. Angola; Huilla, in woody meadows, *Dr. Welwitsch!*

15. **C. calycina,** *Schrank.; DC. Prod.* ii. 129. Herbaceous, sparingly branched, the whole plant clothed with long yellowish-brown silky hairs. Leaves linear, sessile, 2–3 in. long, ¼–½ in. broad, silky beneath. Racemes lax, terminal and lateral. Bracts large foliaceous. Calyx reaching 9–12 lines long, clothed with stiff silky hairs, the teeth reaching down nearly to the base, the upper ones ¼–⅜ in. broad. Corolla sulphur-yellow, about equalling the calyx. Pod sessile, glabrous, 12–18-seeded, about as long as the calyx.

Upper Guinea. Senegambia, *Heudelot!*
Nile Land. Unyoro plateau, *Speke and Grant!*
Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Zanzibar, *Dr. Kirk!*
A common E. Indian species, reaching China and North Australia.

16. **C. anthyllopsis**, *Welw. mss.* A diffuse copiously branched erect annual reaching a foot high, with densely brown-silky erecto-patent or horizontal branches. Stipules setaceous, 2–3 lines long, subpersistent. Petiole 2–3 lines long. Leaves simple, the upper ones oblong or lanceolate, 1–2 in. long, acute, the lower ones roundish, blunt, texture between papyraceous and coriaceous, both sides densely clothed with persistent adpressed brown silky hairs. Flowers in dense

terminal heads like those of the *Chrysocalycinæ*. Lower pedicels 2–3 lines long. Calyx 2½–3 lines long, densely silky, the linear-lanceolate teeth reaching down nearly to the base. Corolla pale yellow, slightly exceeding the calyx, the standard ¼ in. broad, copiously streaked with purple. Pod sessile, oblong, scarcely exceeding the calyx, densely silky, 2–3-seeded.

Nile Land. Abyssinia, *Schimper !*
Lower Guinea. Pungo Andongo and Huilla, *Dr. Welwitsch !*
Habit and pod of the *Chrysocalycinæ*, but leaves simple.

17. **C. microcarpa,** *Hochst. in Herb. Kotschy Nub.* Stems herbaceous, 4–6 in long, diffuse, with copious divaricating slender branches, thinly clothed with spreading brown silky hairs. Stipules minute, setaceous, deciduous. Leaves nearly sessile, with three subsessile, oblanceolate leaflets; central one ½ in. long, 2 lines broad, mucronate, both sides slightly silky. Flowers very much scattered, in clusters of from 2–4 on a short or elongate naked or leafy peduncle. Bracts setaceous, silky, longer than the pedicels. Calyx ⅛ in. long, densely clothed with yellowish silky hairs, teeth lanceolate acuminate, reaching halfway down. Corolla yellow, twice as long as the calyx, petals equal, the standard ⅛ in. broad. Pod ¼ in. long, sessile, finely silky, ⅛ in. thick, about 8-seeded.—Benth. in Lond. Journ. Bot. ii. 573, *C. triantha*, Steud. in Schimp. Pl. Abyss. No. 1190, non DC. *C. lotoides*. A. Rich. Fl. Abyss. 157, non Benth. *Maria-Antonia orientalis*, Parlatore. *C. Mariæ-Antoniæ*, Ascher. *C. dorycnium*. A. Rich. in Herb. Hook. β. *uniflora*, Steud. Flowers usually solitary.

Upper Guinea. Niger country, Nupe, *Barter !*
Nile Land. Nubia, *Kotschy ! Schweinfurth !* Abyssinia, *Schimper ! Petit !*
South Central. In the interior, near the Tropic of Capricorn, *Chapman and Baines !*

18. **C. pisicarpa,** *Welw. mss.* A diffuse very copiously-branched annual with trailing stems 1–2 feet long densely clothed with fine grey spreading pubescence. Stipules setaceous, very minute. Petioles 4–6 lines, downy. Leaflets 3, obovate, 9–18 lines long, 6–10 lines broad, blunt with a faint mucro, sometimes slightly emarginate, both sides green, finally subglabrous. Flowers 2–4 in copious rather lax heads on leaf-opposed downy peduncles 6–9 lines long. Bracts very minute, setaceous. Calyx ⅛ in. long, very silky, the lanceolate acuminate teeth reaching more than halfway down. Corolla yellow, twice the calyx, the roundish pointed glabrous standard 2½ lines broad. Pods sessile, globose, rather oblique, ¼ in. long, firm, turgid, at first densely grey-downy, usually 3-seeded.

Lower Guinea. Huilla, Angola, in damp pastures, *Dr. Welwitsch !*
Very distinct.

19. **C. microphylla,** *Vahl; DC. Prod.* ii. 134. Stems herbaceous, 6–12 in. long, densely cæspitose, the branches firm, spreading, slender, grey, thinly silky. Stipules very minute, linear-lanceolate. Petioles

about a line long. Leaflets three, sessile, obovate, 1–1½ lines long by about half as broad, coriaceous, upper surface grey, glabrous, lower thinly silky. Flowers solitary or in pairs from the axils of the leaves on cernuous pedicels, about equalling the calyx, which is thinly silky, ⅛ in. deep, teeth lanceolate, reaching more than halfway down. Corolla yellow, twice as long as the calyx. Pod oblong, ¼–⅜ in. long, more than half as broad, short-stalked, glabrous, 10- to 15-seeded.—Benth. in Lond. Journ. Bot. ii. 573; *C. pumila*, Hochst. et Steud. in Schimp. Pl. Arab. No. 788.

Nile Land. Coast of Nubia, *Schweinfurth!* Abyssinia, *teste Schweinfurth.*
Also Arabian and Egyptian.

20. **C. podocarpa,** *DC. Prod.* ii. 183. Stems herbaceous, erect, 1–2 feet high, with copious erecto-patent branches thinly clothed with long yellowish silky hairs. Stipules lanceolate-falcate, ¼–½ in. long, persistent. Petioles 1–1½ in. long, silky, erecto-patent. Leaves with three sessile oblanceolate leaflets, central one 1–1½ in. long, ¼–⅜ in. broad, mucronate, both sides thinly silky. Flowers only 2–3 together in long-stalked clusters in the axils of the leaves. Bracts minute, setaceous. Calyx silky, ⅜ in. deep, teeth lanceolate-acuminate, reaching three-quarters of the way down. Corolla yellow, twice as long as the calyx; standard 4 lines broad, not striated, glabrous; keel with a distinct beak ¼ in. long. Pod with a stalk half as long as the calyx, ¾–1 in. long, ½ in. thick, glabrous, 12–18 seeded.—Guill. et Perr. Fl., Seneg. 166; Benth. in Lond. Journ. Bot. ii. 589; A. Rich. Fl. Abyss. i. 158; *C. pilifera* and *arvensis*, Klotzsch in Peters' Mossamb. Bot. 54; *C. physocarpa*, Fenzl.

Upper Guinea. Senegambia, to the borders of the Sahara, *Perrottet! Bidjem!*
Nile Land. Abyssinia, *Schimper! Quartin-Dillon!* Nubia, *Kotschy!*
Mozamb. Distr. Mozambique, *Dr. Peters!*
Abyssinian name, *Seppere-quasot*, according to Schweinfurth.

21. **C. polyclados,** *Welw. mss.* A glabrous annual, very copiously branched at the crown of the root, with diffuse slender rigid dichotomously-forked stems half a foot long. Bracts minute, setaceous. Petioles 2–4 lines. Leaflets 3, linear, dark green, glabrous, rather fleshy, acute, 6–18 lines long, a line or less broad. Flowers always solitary, usually terminal, on slender peduncles 6–18 lines long with a linear bract a little below the flower. Calyx 3½–4 lines long, the lanceolate-acuminate teeth reaching more than halfway down. Corolla slightly exceeding the calyx, the standard orbicular, pale blue, 4 lines broad, the keel pale yellow. Pod oblong, distinctly stalked, glabrous, 6–8 lines long, 4 lines broad, 10–12-seeded.

Lower Guinea. Huilla, Angola, at 5500 ft. *Dr. Welwitsch!*

22. **C. spinosa,** *Hochst. in Herb. Schimp. Abyss.* 150. Stem annual only, but almost fruticose in the lower part, 6–18 in. long, the upper part covered with short grey pubescence, with copious spreading branches and usually with abundant long sharp spines downwards. Stipules minute,

setaceous. Leaves close and numerous, petioles $\frac{1}{8}$ in. long, slender, with three oblanceolate leaflets with a distinct notch at the apex, the central one 2–4 lines long, 1–2 lines broad, glabrous above, slightly silky beneath. Flowers much scattered, solitary or in pairs, most of them pendulous from the spines. Pedicels 1 line long. Calyx thinly silky, $\frac{1}{8}$ in. long, teeth lanceolate-acuminate, reaching halfway down. Corolla yellow, twice as long as the calyx. Pod sessile, oblong, $\frac{3}{8}$–$\frac{1}{2}$ in. long, half as broad, finely pubescent, 8–10-seeded.—Benth. in Lond. Journ. Bot. ii. 576. A. Rich. Fl. Abyss. i. 156.

Nile Land. Nubia, *Kotschy!* White Nile, *Petherick!* Abyssinia, *Schimper! Quartin-Dillon! Petit!*

Lower Guinea. Angola, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Stewart!* (A spineless variety, with much smaller and closer leaves than usual.)

23. **C. cistoides,** *Welw. mss.* A suffruticose perennial 1–2 ft. high, with numerous erecto-patent rigid slender branches, with a little inconspicuous adpressed grey pubescence. Stipules none seen. Leaves subsessile; leaflets 3, oblanceolate, 5–6 lines long, rigidly coriaceous, bluntish with a minute mucro, subglabrous above, finely silky beneath. Flowers 2–3 together, subsessile at the end of the branches, or a few solitary in the axils of the upper leaves. Calyx 2 lines long, finely grey-silky, the lanceolate teeth reaching down nearly to the base. Corolla pale yellow, scarcely as long as the calyx. Pod hard, globose, 2 lines long, finely adpressed grey-silky, 3–4-seeded.

Lower Guinea. Huilla and Pungo Andongo, Angola, in sandy thickets, *Dr. Welwitsch!*

24. **C. caudata,** *Welw. mss.* An erect shrub 2–$2\frac{1}{2}$ ft. high, with numerous rigid erecto-patent woody branches, clothed with inconspicuous adpressed grey pubescence. Stipules none seen. Leaves subsessile; leaflets 3, oblanceolate, 6–9 lines long, blunt with a mucro, subcoriaceous, both sides pale green with a little adpressed grey pubescence. Flowers 1–6 together at the end of the branches, when clustered not pedunculated. Pedicels 2 lines. Calyx 3–$3\frac{1}{2}$ lines, adpressed silky, the lanceolate teeth reaching much more than halfway down. Corolla yellow, slightly exceeding the calyx. Pod sessile, oblong, 6–7 lines long whilst still immature, densely clothed with fine brown silky hairs, 15–18-seeded.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 ft., *Dr. Welwitsch!*

25. **C. Forbesii,** *Baker.* Stem suffruticose, 12–18 in. long, erect, slightly branched, densely clothed throughout with fine grey down. Stipules linear, equalling the petioles, which are 2 lines long, slender, pubescent. Leaves with 3 subsessile oblanceolate leaflets, central one 4–6 lines long, both sides finely downy. Flowers solitary or in short-stalked clusters of 2–3 in the axils. Pedicel 1 line long, silky. Calyx silky, $\frac{1}{4}$ in. long, teeth lanceolate-acuminate, reaching halfway down. Corolla yellowish, twice as long as calyx; standard veined, $\frac{1}{4}$ in. broad.

Pod sessile, very silky, $\frac{3}{8}$ in. long, half as broad, 10–12-seeded.—*C. lævigata* β. *villosior*, Benth. in Lond. Journ. Bot. ii. 577.

Mozamb. Distr. Mozambique, *Forbes!* Zambesi land, *Dr. Kirk!*

The Mascarene *C. lævigata*, Lam., differs by its obovate leaflets, longer petiole ($\frac{1}{2}$ in. long), and glabrous stem, leaves, and pods. Our plant may be a variety of *C. spinosa*.

26. **C. variegata,** *Welw. mss.* An undershrub with very diffuse flexuose wide-trailing slender densely grey-downy branches 1–2 ft. long, 2–4 times forked, the uppermost branchlets divaricate with their leaves much reduced. Stipules linear, 1–2 lines. Petioles equalling or slightly exceeding the stipules. Leaflets 3, obovate, distinctly stalked, rigidly coriaceous, upper surface grey-green, glabrous, lower covered with dense close persistent brownish or grey silky pubescence, the central one 12–16 lines long, 7–9 lines broad, blunt with a faint mucro. Flowers 1–4 together in copious short-peduncled lateral and terminal umbels. Pedicels 1–2 lines, densely grey-downy. Bracts minute, linear, persistent. Calyx $2\frac{1}{2}$–3 lines long, densely grey-downy, the lanceolate teeth exceeding the tube. Corolla half as long again as the calyx, standard violet, keel and wings yellow. Pod sessile, oblong, finely grey-downy, 4–5 lines long, 2-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

27. **C. ervoides,** *Welw. mss.* A diffuse perfectly glabrous undershrub with ascending slender branches 1–2 ft. long, 2–3 times dichotomously forked. Stipules rigid, lanceolate, foliaceous, $\frac{1}{4}$–$\frac{1}{2}$ in. long, with one distinct tooth on the outer margin. Petioles 3–6 lines long. Leaflets 3, linear, rigid, acute, the central one 8–12 lines long, 1–2 lines broad, both sides green, strongly-veined. Flowers few, 1–2 together on short lateral and terminal peduncles. Calyx glabrous, $3\frac{1}{2}$–4 lines long, the teeth reaching more than halfway down, the upper ones lanceolate, the lower linear. Corolla pale yellow, with a tinge of violet, scarcely exceeding the calyx. Pod oblong, sessile, glabrous, 12–15 lines long, 6–7 lines thick, 6–8-seeded.

Lower Guinea. Huilla, Benguela, in damp meadows, *Dr. Welwitsch!*

28. **C. abscondita,** *Welw. mss.* An erect undershrub 1–2 ft. high, with numerous ascending straight branches clothed with fine spreading soft grey or brownish hairs. Stipules minute, setaceous. Leaves close, numerous, erecto-patent, quite sessile; leaflets 3, lanceolate, acute, 6–9 lines long, both sides thinly clothed with hairs like those of the stem. Flowers 6–15 in very dense sessile terminal heads, scarcely pedicellate. Bracts linear, as long as the calyx. Calyx $3\frac{1}{2}$ lines long, densely silky, the linear teeth reaching much more than halfway down. Corolla yellowish, scarcely as long as the calyx. Pod roundish, turgid, sessile, hard, densely silky, 3–$3\frac{1}{2}$ lines long, 4–5-seeded.

Lower Guinea. Huilla, and Pungo Andongo, Angola, *Dr. Welwitsch!*

29. **C. Perrottetii,** *DC. Prod.* 2, 128. Stem herbaceous, 1–2 ft., silky, branched from the base. Stipules small, linear. Leaves nearly

sessile, with 3 subsessile linear leaflets, the central one 2 in. long, ¼ in. broad, glabrous above, beneath with adpressed silky hairs. Flowers in dense heads of 6–8 flowers, terminal on the main stem and branches. Calyx 4 lines long, the bracts linear, not half as long as the calyx, teeth lanceolate, three upper ones reaching halfway down, lower ones narrower and deeper, both tube and teeth densely clothed with bright brown silky pubescence. Corolla bright yellow, slightly exceeding the calyx. Pod sessile, round, densely silky, 4-seeded.—*Heylandia Perrottetii*, Spreng. Syst. Veg. iv. 267; *Chrysocalyx Perrottetii*, Guill. et Perr. Fl. Seneg. 160, t. 43, fig. 2.

Upper Guinea. Senegambia, *Perrottet!*

30. **C. gracilis,** *Walp. Rep.* i. 591. Stems herbaceous, procumbent, 1–2 ft., with copious spreading branches, upper part slightly silky. Stipules small, linear. Leaves nearly sessile, with three subsessile lanceolate leaflets, 1½–2 in. long, ⅜–½ in. broad, blunt with a mucro, lateral ones smaller, upper surface glabrous, lower with fine adpressed silky hairs. Flowers in oblong heads of 3–4 each, terminal on the main stem and branches. Calyx in flower 4 lines long, bracts minute, setaceous, teeth lanceolate, three upper ones reaching halfway down, lower ones narrower and deeper, both tube and teeth densely clothed with bright-brown silky pubescence. Corolla yellowish tinged with red, about equalling the calyx. Pod sessile, roundish, densely silky, 4-seeded.—*Chrysocalyx gracilis*, Guill. et Perr. Fl. Seneg. 159.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Ingram!*

Doubtfully distinct from the preceding. The leaflets are much broader, and only the upper part of the stem is a little silky.

31. **C. macrocalyx,** *Benth. in Lond. Journ. Bot.* 2, 572. Stem firm, herbaceous, erect or procumbent, 1½–2 ft., with copious erecto-patent branches, upper part clothed with short close pubescence. Stipules small, linear. Leaves nearly sessile, with three subsessile leaflets, terminal one oblanceolate, 1½–2 in. long, ⅜–¾ in. broad, blunt, retuse or mucronate, upper surface glabrous, lower slightly silky. Flowers in dense rounded heads terminal on the main stem and branches. Bracteoles small, setaceous, not more than half as long as the calyx. Calyx in flower ½ in., in fruit ¾ in. long; teeth ovate-lanceolate, reaching three-quarters of the way down, 2½–3 lines broad, both tube and teeth densely coated with short stiff silky greyish-brown hairs. Corolla bright-yellow; standard ½–⅝ in. broad, slightly exceeding the calyx, the lower part marked with several dark lines radiating from the throat. Pod roundish-oblong, sessile, densely coated with short bright brown silky pubescence; the seeds usually six.—*Chrysocalyx Petitiana*, A. Rich. Fl. Abyss. i. 159.

Upper Guinea. Senegambia, *Heudelot!* Guinea proper, *Barter!*
Nile Land. Abyssinia, *Petit!*

32. **C. ebenoides,** *Walp. Rep.* i. 590. Stem herbaceous, erect, 12–18 in. high, with copious long spreading or upcurved branches,

upper part densely silky, hairs bright brown, adpressed, and rather short. Stipules small, linear. Leaves nearly sessile, with three subsessile linear-oblong leaflets, the central one $1\frac{1}{2}$–2 in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, bluntish with a mucro, lateral ones generally smaller, upper surface nearly glabrous, lower finely silky. Flowers in dense oblong heads terminal on the main stem and branches. Calyx in flower 4 lines long, the two bracts which are attached near the base lanceolate, half as long as the calyx; teeth lanceolate, the three upper reaching halfway down, two lower ones narrower and deeper, both tube and teeth densely clothed with long bright-brown silky pubescence. Corolla about equalling the calyx, yellow, standard $\frac{1}{4}$ in. broad, wings rather shorter, keel much and suddenly upcurved. Pod sessile, roundish-oblong, densely silky, 6–8-seeded.—*Chrysocalyx ebenoides*, Guill. et Perr. Fl. Seneg. 158, t. 43, fig. 1.

Upper Guinea. Senegambia, *Leprieur and Perrottet!* Galam and the Sahara, *Heudelot!*

33. **C. densicephala,** *Welw. mss.* An erect shrub with terete straight woody branches densely clothed with brown silky pubescence. Stipules linear, minute, deciduous. Petioles 3–6 lines. Leaflets 3, oblanceolate, the central one 18–27 lines long, 10–12 lines broad, blunt with a distinct mucro; side ones much smaller; texture subcoriaceous; upper surface glabrous, lower densely clothed with persistent bright brown silky hairs. Flowers 20–40 in very dense round or oblong shortly-peduncled terminal heads an inch thick. Bracts minute, setaceous. Pedicels very short. Calyx $4\frac{1}{2}$–5 lines, densely brown-silky, the lanceolate teeth reaching down nearly to the base. Corolla slightly exceeding calyx, turning purplish or nearly black when dried; keel $\frac{1}{4}$ in. deep, with an abrupt beak and a distinct fringe of whitish cottony pubescence along the base. Ovary oblong, densely brown-silky. Pod not seen.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

34. **C. nigricans,** *Baker.* Stem firm-herbaceous, 2–3 ft. high, clothed throughout with short grey spreading or deflexed silky hairs, copiously branched, with the lower branches erecto-patent and again compound. Stipules small, linear-lanceolate. Petioles $1\frac{1}{2}$–2 in. long, spreading, silky. Leaves with three subsessile oblanceolate leaflets, central one $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad, mucronate, both sides thinly silky. Flowers in rounded heads terminal on the main stem and branches. Calyx nearly sessile, $\frac{1}{2}$ in. long, bracts short, roundish or ovate-acuminate, teeth reaching three-quarters of the way down, 2–3 lines broad, oblong-acuminate. Corolla quite included, both tube and wings thinly silky, not more than $\frac{1}{4}$ in. long, yellow, but like the leaves and calyx turning black when dried, the standard $\frac{1}{4}$ in. broad, the keel ciliated on the base. Ovary densely silky. Young pods globose, sessile, very silky.

Nile Land. Mininga, *Speke and Grant* (183)*!*

35. **C. atrorubens,** *Hochst. in Herb. Kotschy, Nub. No.* 265. Stem firm-herbaceous, erect, 1½–3 ft. high, with copious erecto-patent branches, upper part thinly clothed with spreading bright silky hairs. Stipules small linear. Leaves nearly sessile, with three subsessile leaflets, terminal one oblanceolate, 1–1½ in. long, ¼–⅜ in. broad, obtuse or mucronate, upper surface glabrous, lower thinly clothed with adpressed silky pubescence. Flowers in dense rounded heads, terminal on the main stem and branches. Calyx in flower ¼ in. long, bracts setaceous, shorter than the calyx, teeth linear, reaching three-quarters of the way down, densely coated with bright brown silky pubescence. Corolla equalling the calyx, yellow, tinged with red, the standard 2 lines broad, slightly silky on the back. Pod sessile, quite twice as long as broad, ⅜ in. long, silky, 8–10-seeded.—Benth. Lond. Journ. Bot. ii. 572; *Chrysocalyx rubiginosa,* Guill. et Perr. Fl. Seneg. 158; *Crotalaria iodina,* Benth. in Lond. Journ. Bot. l.c.

Upper Guinea. Senegambia, *Perrottet!* Guinea, Nupe, and Jeba on the Quorra, *Barter!*

Nile Land. Nubia, *Kotschy!*

36. **C. dumetorum,** *Baker.* Stems firm-herbaceous, erect, 1–2 ft. high, densely clothed upwards with brown velvety pubescence. Stipules setaceous, very minute. Petioles 3–6 lines. Leaflets 3, oblanceolate or oblanceolate-oblong, the central one 2–3 in. long, 8–12 lines broad, blunt with a mucro, subcoriaceous, both sides with adpressed firm short silky hairs. Heads round or oblong, 6–12-flowered, terminal, usually shortly peduncled. Bracts minute, setaceous. Pedicels ⅛ in. Calyx ¼ in. long, very silky, the lanceolate teeth exceeding the tube. Corolla 4 lines long, turning dark reddish-purple when dried. Pod sessile, oblong, persistently densely brown-velvety, hard, turgid, 6–7 lines long, 3–4 lines broad, 3–4-seeded.

Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

37. **C. ononoides,** *Benth. in Lond. Journ. Bot.* ii. 572. Stem 1–4 ft. high, trailing or suberect, annual, firm-herbaceous, copiously branched, clothed throughout with erecto-patent bright brown silky hairs. Stipules ¼ in. long, spreading, silky, linear-setaceous. Petioles 2–3 lines long, silky. Leaves with three subsessile linear-oblong leaflets, central one 1–1½ in. long, ¼–½ in. broad, narrowed to an acute point, upper surface glabrous, lower thinly coated with fine silky hairs. Flowers in dense rounded heads at the summit of the main stem and branches. Pedicel ⅛ in. long, very silky. Calyx very silky, ⅜–½ in. long, teeth linear, reaching three-quarters of the way down, all the bracts linear-setaceous and as long as the calyx. Corolla purplish-red, rather shorter than the calyx, the standard 2 lines broad, with numerous close distinct darker veins; keel yellow. Pod ⅜ in. long, sessile, twice as long as broad, glabrous, 8–10-seeded.—*C. involucrata,* Soland. mss. in Herb. Brit. Mus.

Upper Guinea. Sierra Leone, *Afzelius! G. Don!*

Nile Land. Karaguè, *Speke and Grant!*

Lower Guinea. Golungo Alto, and Pungo Andongo, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Island of Zanzibar, *Speke!*

38. **C. cephalotes,** *Steud. in Schimp. Pl. Abyss. No.* 695. Stem simple or with several curved ascending branches, firm-herbaceous, 6–18 in. high, annual, the upper part densely silky, hairs grey, erecto-patent. Flowers in dense sessile rounded heads at the summit of the main stem and branches. Leaves distant on the lower part of the stem but densely aggregated upwards. No stipules seen. Petioles $\frac{1}{2}$ in. long, compressed and winged upwards, densely silky. Leaflets 3, quite sessile, oblanceolate, central one 1–$1\frac{1}{2}$ in. long, 1–2 lines broad, mucronate, both sides densely clothed with yellow silky pubescence. Pedicels $\frac{1}{4}$ in. long, silky. Calyx $1\frac{1}{2}$–2 lines deep, silky, teeth linear-lanceolate, reaching down nearly to the base. Corolla yellow, nearly half as long again as the calyx, the keel long-beaked, much and suddenly upcurved. Pod sessile, roundish-oblong, $\frac{1}{4}$ in. long, 2-seeded, densely coated with yellowish pubescence.—A. Rich. Fl. Abyss. i. 156.

Upper Guinea. Niger country; Nupe, *Barter!*
Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Petit!* Madi woods, *Speke and Grant!*
Lower Guinea. Huilla, and Pungo Andongo, Angola, *Dr. Welwitsch!*

39. **C. nubica,** *Benth. in Lond. Journ. Bot.* ii. 581. Stem herbaceous, 12–18 in. long, diffusely and dichotomously branched, slightly silky. Stipules minute, lanceolate. Petioles $\frac{1}{2}$ in. long, slender, silky. Leaves with three sessile linear leaflets, the central one 1–$1\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, mucronate, upper surface glabrous, lower slightly pubescent. Flowers in copious long-stalked lax lateral racemes ultimately 3–5 in. long. Bracts minute, setaceous. Pedicels 1 line long, silky. Calyx 1 line deep, finely silky, cut three-quarters of the way down; teeth lanceolate. Corolla yellow, twice as long as the calyx. Pod sessile, roundish-oblong, 2 lines long, $\frac{1}{8}$ in. broad, finely silky, 4–6-seeded.—Harv. Fl. Cap. ii. 45; *C. sphærocarpa* var. *angustifolia,* Hochst.

Upper Guinea. Senegal, *Bidjem!*
Nile Land. Nubia, *Kotschy!*
South Central. In the interior, near the Tropic, *Chapman and Baines!*
Very near *C. sphærocarpa,* but pubescent, and the leaves narrower. A Cape species.

40. **C. sphærocarpa,** *Perrott. in DC. Prod.* ii. 133. Stem herbaceous, a foot long, diffusely branched, glabrous. Stipules small, linear. Petioles $\frac{1}{2}$ in. long, glabrous. Leaves with three sessile oblanceolate leaflets, central one an inch long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, mucronate, both surfaces glabrous. Flowers in copious long-stalked lateral and terminal lax racemes ultimately 3–5 inches long. Bracts minute, setaceous. Pedicels 1 line, spreading. Calyx 1 line long, glabrous, the teeth linear-lanceolate, reaching three-quarters of the way down. Corolla yellow, twice as long as the calyx. Pod shortly-stalked, roundish-oblong, glabrous, $\frac{1}{8}$ in. broad, 2 lines long, 2–4-seeded.—Guill. et Perr. Fl. Seneg. i. 167; *C. polycarpa,* Benth. in Lond. Journ. Bot. ii. 580.

Upper Guinea. Senegambia, *Perrottet! Heudelot!* Sierra Leone, *Afzelius!*

41. **C. nutans,** *Welw. mss.* A copiously dichotomously-branched annual, 1½–2 feet high with finely yellow-grey silky branches. Stipules linear, deciduous. Petioles 9–12 lines. Leaflets 3, oblanceolate, 12–18 lines long, 3–4 lines broad, blunt with a very faint mucro, glabrous above when mature, finely adpressed-silky beneath. Flowers very numerous in moderately dense terminal racemes reaching 6–8 inches long, 9–10 lines broad. Bracts minute setaceous. Pedicels 1 line long, densely silky, finally cernuous. Calyx 1 line long, densely silky, the lanceolate teeth reaching more than halfway down. Corolla 4 lines long, bright yellow; standard ovate, acute; keel long-beaked. Pod subglobose, 2–2½ lines long, turgid, glabrescent, 2-seeded, distinctly stipitate.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

42. **C. filicaulis,** *Welw. mss.* An erect annual about a foot high; stems densely finely grey-silky, very slender with a few rigid erecto-patent branches, the whole plant turning blackish when dried. Stipules 0. Petioles 1–1½ line. Leaflets 3, shortly-stalked, linear, 3–6 lines long, ½–¾ line broad, acute, slightly grey-silky beneath. Flowers in elongated very narrow terminal racemes, up to 12–15 on the main stem. Bracts linear, very minute. Pedicels ½–1 line, rigidly suberect, densely grey-silky. Calyx 1–1½ line, densely grey-silky, the teeth reaching down nearly to the base, the upper lanceolate, the lower linear. Corolla nearly twice the calyx, yellow, turning blackish when dried, the standard clothed on the back with persistent grey-silky hairs. Pod sessile, roundish, glabrescent, at first finely grey-silky, 2 lines long, 1–2-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

43. **C. tenuirama,** *Welw. mss.* An erect annual 1–2 ft. high with very numerous slender straight erecto-patent finely grey-downy branches. Stipules 0. Petioles 2–3 lines. Leaflets 3 (uppermost leaves casually simple), oblanceolate, 3–6 lines long, blunt with a mucro, pale green above, glaucous and thinly grey-silky beneath. Flowers in terminal elongated narrow racemes, up to 12–20 on the main stems, casually but not usually prolonged into the axils of the upper leaves. Bracts linear, minute. Pedicels ½–1 line, finely grey-silky. Calyx ⅛ in., finely grey-silky, the lanceolate acuminate teeth equalling the tube. Corolla bright yellow, twice the calyx, the standard streaked with purple, quite glabrous on the back. Pod sessile, roundish-oblong, finely silky, 1–2-seeded.

Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!* Very near *C. hyssopifolia.*

We have imperfect specimens of a closely-allied plant, without fruit, from Sierra Leone, *Morson!* and Senegambia, *Heudelot!* which approaches *C. hyssopifolia,* by its smaller corolla and closer racemes.

44. **C. hyssopifolia,** *Klotzsch in Peters' Mossamb. Bot.* 55. An erect annual reaching 1½–2 ft. high with numerous ascending finely

grey-downy branches. Stipules 0. Petioles 2–3 lines. Leaflets 3, oblanceolate, 6–9 lines long, subglabrous, green, blunt with a mucro. Flowers in dense sessile terminal racemes up to 30–40 on the main stem. Bracts linear, minute. Pedicels 1–1½ line. Calyx 1 line deep, densely brown-silky, the lanceolate teeth reaching more than halfway down. Corolla bright yellow, twice the calyx, the standard densely brown-silky on the back. Pod sessile, roundish, densely silky, 2 lines long, 2–4-seeded.—*C. gracillima*, Klotzsch. loc. cit.

Nile Land. Abyssinia, *Schimper!* Mininga, *Speke and Grant!*
Mozamb. Distr. Mozambique, *Dr. Peters!*
Closely allied to the Cape *C. globifera*, but smaller in all its parts with densely silky, usually 2–seeded pods.

45. **C. parvula,** *Welw. mss.* An erect annual under a foot high with numerous finely grey-silky spreading branches from the crown of the root. Stipules very minute, setaceous, deciduous. Petioles 1½–2 lines. Leaflets 3, oblanceolate, 3–6 lines long, blunt with a distinct mucro, slightly grey-silky beneath. Flowers 6–30 in close terminal heads ½ in. broad prolonged into the axils of the upper leaves. Bracts minute, setaceous. Pedicels ½–1 line, finely silky. Calyx 1 line long, silky, the linear-lanceolate teeth exceeding the tube. Corolla greenish-yellow, half as long again as the calyx. Pod sessile, round, ⅛ in. thick, glabrescent, at first thinly brown-silky, 2-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

46. **C. erythrophleba,** *Welw. mss.* An erect annual reaching 2 ft. high with numerous long slender ascending branches clothed with close fine white silky pubescence. Stipules setaceous, very minute. Petioles 2–3 lines, with a tuft of silvery hairs at the base. Leaflets 3, very narrowly oblanceolate, often laterally complicate, 3–4 lines long, ½–¾ line broad, blunt with a mucro, finely argenteous principally beneath. Flowers 6–15 in close terminal heads and much prolonged into the axils of the upper leaves. Pedicels ½–1 line densely silvery. Calyx ⅛ in. long, densely grey-silky, the mouth oblique, the teeth as long as the tube. Corolla 4 lines long, bright yellow beautifully veined with fine parallel streaks of purple, the long gradually-beaked keel exceeding the standard. Ovary oblong, subsessile, finely grey-silky, 2–3-ovulate. Pod unknown.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

47. **C. prolongata,** *Baker.* An erect sparingly-branched annual 1–2 ft. high with thick stems densely clothed with brown-silky pubescence. Stipules setaceous, deciduous. Petioles 9–15 lines. Leaflets 3, shortly-stalked, oblanceolate or obovate-oblong, both sides green, upper glabrescent, lower finely silky, the central one 12–18 lines long, 3–9 lines broad, blunt with a mucro which in the upper leaves is lengthened out and hooked. Flowers 20–50 in racemes dense and cylindrical at the end of the branches, but also laxly prolonged down into the axils of the upper leaves. Bracts minute, linear, silky. Pe-

dicels ½–1 line. Calyx ⅛ in. long, densely silky, the linear-lanceolate teeth exceeding the tube. Corolla 3 lines long, reddish when dried. Pod oblong, sessile, turgid, finely silky, 2 lines long, 2-seeded.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

48. **C. argyræa,** *Welw. mss.* A diffuse moderately-branched ascending undershrub, branches silvery with close tomentum like those of *Indigofera argentea.* Stipules 0. Petioles 9–15 lines. Leaflets fleshy, glabrous, very glaucous, short-stalked, oblanceolate-oblong, the central one 9–15 lines long, 5–8 lines broad, blunt, emarginate. Flowers a dozen or more in a few lax short-peduncled lateral racemes. Bracts 0. Pedicels 1½–2 lines silvery. Calyx 2 lines, broadly campanulate, the upper teeth lanceolate, equalling the tube, the lower linear, a little longer. Corolla ½ in. long, bright yellow. Pod distinctly stalked, very hard, oblong, ½ in. long, 4 lines broad, glabrous, 3-seeded, the upper suture a depression, the lower one a prominent ridge.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch!*

49. **C. ivantulensis,** *Welw. mss.* A copiously-branched shrub 2–4 ft. high with finely grey-downy straight branchlets. Stipules minute, setaceous, deciduous. Petioles 6–9 lines, erecto-patent. Leaflets 3, distinctly stalked, oblanceolate, blunt with a faint mucro, reaching 1½–2 inches long, 6–10 lines broad, green and glabrous above, glaucous and inconspicuously grey-silky beneath. Flowers 12–20 in close shortly-stalked terminal (rarely lateral) racemes 15-18 lines broad. Bracts minute, linear. Pedicels 1½–3 lines, densely grey-silky. Calyx obliquely broadly campanulate, 2½ lines long, densely grey-silky, the deltoid teeth not quite as long as the tube. Corolla bright yellow, twice the calyx, not striated, the standard glabrous on the back. Pod distinctly-stalked, oblong, 7–8 lines long, 3–3½ lines broad, finely grey-silky, 8–10-seeded.

Lower Guinea. Huilla, Benguela, on the shores of Lake Ivantula, *Dr. Welwitsch!*

50. **C. ramosissima,** *Baker.* An erect undershrub with very numerous erecto-patent stiff slender forked finely grey-downy branches. Stipules lanceolate, very minute. Petioles 2–4 lines. Leaflets 3, shortly-stalked, oblanceolate-oblong, reaching 6–12 lines long, 3–6 lines broad, blunt with a faint mucro, glabrescent above, finely grey-downy beneath. Flowers 6–12 in very numerous principally terminal lax racemes. Bracts setaceous, very minute. Pedicels ½–1 line, densely silky. Calyx ⅛ in., thinly grey-silky, the lanceolate teeth exceeding the tube. Corolla bright yellow, glabrous, twice the calyx. Pod globose, distinctly stalked, 4 lines long, persistently clothed with spreading grey-silky hairs, 5–6-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

51. **C. amœna,** *Welw. mss.* A suberect shrub with numerous ascending terete branchlets clothed with dense fine grey short pubescence.

Stipules very minute, setaceous. Leaves sessile. Leaflets 3, oblong or oblanceolate-oblong, the central one reaching 18–24 lines long, 8–12 lines broad, blunt with a mucro, rigidly coriaceous, glabrous above, persistently clothed beneath with short adpressed grey-silky hairs. Flowers 3–6 in copious lax sessile or shortly-peduncled terminal racemes. Bracts minute, linear. Pedicels 3–6 lines, rigidly erecto-patent, densely brown-silky. Calyx 4½–5 lines, coriaceous, thinly silky, the lanceolate teeth longer than the broadly campanulate tube. Corolla slightly exceeding the calyx, pale-purplish when dried, all the petals thick in texture, densely silky on the outside. Pod shortly-stalked, oblong, an inch long, half as broad, densely clothed with per sistent red-brown velvety pubescence, 12–15-seeded.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

52. **C. cordata,** *Welw. mss.* A shrub 2–3 ft. high, many times dichotomously branched with very flexuose almost scandent branches clothed with adpressed grey-silky pubescence. Stipules rigidly coriaceous, forming a wing to the petiole, reaching an inch long, ⅜ in. broad, obcordate, cuneately decurrent on the branch. Main petioles 12–16 lines. Leaflets 3, shortly stalked, oblanceolate, reaching 2–3 in. long, 9–12 lines broad, bluntish with a distinct mucro, subcoriaceous, pale green, glabrous above, densely clothed with adpressed persistent grey or brown silky pubescence beneath. Flowers 6–12 in moderately lax shortly-peduncled terminal racemes. Bracts linear, minute. Pedicels 3–4, ultimately 6–8 lines. Calyx ½ in. long, densely adpressed-silky, the lanceolate acuminate teeth reaching down nearly to the base. Corolla reddish when dried, slightly exceeding the calyx. Pod shortly stalked, oblong, 12–15 lines long, ¾ in. broad, densely persistently brown-silky, 10–12-seeded.

Lower Guinea. Huilla, Angola, sparingly in two places, *Dr. Welwitsch!*

53. **C. orixensis,** *Roxb.; DC. Prod.* ii. 131. Stems herbaceous, 6–18 in. long, prostrate or suberect, copiously branched from the base, clothed with long spreading silky hairs. Stipules small, linear-lanceolate, spreading or decurved. Petioles ½–1½ in. long, slender, silky. Leaves with three sessile oblong-obovate leaflets, central one ¾–1½ in. long, ½ in. broad, mucronate, upper surface glabrous, lower thinly silky. Flowers in copious stalked very lax lateral racemes of 3–6 flowers each. Bracts conspicuous, cordate-ovate, persistent, lower ones sometimes ¼ in. broad. Pedicels slender, spreading, the lowest ½ in. long. Calyx silky, ¼ in. deep, teeth lanceolate-acuminate, reaching three-quarters of the way down. Corolla scarcely exceeding the calyx. Pod stalked, the stalk half as long as the calyx, ⅜–½ in. long, half as broad, glabrous, many-seeded.—Wight et Arn. Prod. i. 193; Mart. in Denk. Acad. Mun. vi. 157 t. H. Benth. in Lond. Journ. Bot. ii. 588. *C. macropoda*, Hochst., A. Rich. Fl. Abyss. i. 157.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*

An East Indian species, well marked in the group by its peculiar raceme and large persistent cordate bracts.

54. **C. versicolor,** *Baker.* An erect annual 1–2 ft. high with numerous long finely grey-downy branches curving upwards from the crown of the root. Stipules setaceous, $\frac{1}{4}$–$\frac{3}{8}$ in. long. Petioles 3–6 lines. Leaflets 3, shortly-stalked, obovate-oblong, blunt with a mucro, reaching 2–3 in. long, 12–18 lines broad, glabrescent above, finely grey-silky beneath. Flowers 6–12 in moderately lax short-peduncled lateral racemes 12–15 lines broad. Bracts setaceous, 1–1$\frac{1}{2}$ line. Pedicels 1$\frac{1}{2}$–2 lines, patent or cernuous, densely grey-silky. Calyx $\frac{1}{2}$ in. long, coriaceous, thinly grey-silky, the lanceolate teeth ($\frac{1}{8}$ in. broad) reaching down nearly to the base. Corolla slightly exceeding the calyx when expanded, reddish-blue and yellow, the standard glabrous on the back. Pod distinctly stalked, an inch long, 6–7 lines broad, inconspicuously grey-downy, 8–12-seeded.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

55. **C. Doniana,** *Baker.* Stem firm-herbaceous, prostrate, more than a foot long, terete, finely-downy, irregularly branched. Stipules 0. Petioles an inch long, spreading, finely-downy. Leaflets 3, sessile, oblong, terminal one 1$\frac{1}{2}$–1$\frac{3}{4}$ in. long by about half as broad, narrowed to both ends, membranous glabrous and green on both sides. Flowers in few-flowered lax lateral racemes. Pedicels 2 lines long, silky, with small linear-setaceous bracts at the base. Corolla not seen. Pod rather above an inch long, $\frac{1}{2}$ in. broad, glabrous, with a pedicel $\frac{1}{4}$ in. long.

Upper Guinea. Sierra Leone, *G. Don!* Resembles *C. orixensis* in general habit and pod, but the pedicels short and bracts minute.

56. **C. Onobrychis,** *A. Rich. Fl. Abyss.* i. 154. Stem 1$\frac{1}{2}$ ft. high, erect, branched, the branches downy, striated. Stipules minute. Leaves stalked, leaflets oblong-obovate or elliptical or sublanceolate, acute, silky beneath. Flowers in many-flowered elongated terminal or lateral racemes. Bracts linear. Calyx silky, teeth equal, oblong-lanceolate, acute. Corolla under $\frac{1}{2}$ in. long, purplish, veined, the standard narrow. Pod oblong, inflated, $\frac{1}{2}$ in. long, glabrous, short-stalked.

Nile Land. Abyssinia, *Quartin-Dillon.* "Flowers in form and general aspect like those of *Onobrychis sativa.*" Not seen.

57. **C. goreensis,** *Guill. et Perrott. Fl. Seneg.* i. 165. Stem herbaceous or suffruticose, 1–3 ft. high, copiously branched, finely-pubescent throughout, branches erecto-patent deeply striated. Stipules large, lanceolate-falcate, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Petioles erecto-patent, slightly silky, 1–1$\frac{1}{2}$ in. long. Leaves with three sessile oblanceolate leaflets, central 1–3 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, mucronate, upper surface glabrous, under more or less finely silky. Flowers in sessile terminal racemose heads, those of the main stem dense 12–20-flowered, those of the branches 4–6-flowered. Bracts minute deciduous. Pedicels 1–1$\frac{1}{2}$ lines long, silky. Calyx 3–4 lines deep, very silky, the teeth lanceolate, reaching halfway down. Corolla yellow, tinged with red, twice as long as the calyx, not striated. Pod sessile, $\frac{5}{8}$–$\frac{3}{4}$ in. long, half as thick, oblong,

when young densely silky, glabrescent, 10–12-seeded.—Benth. in Lond. Journ. Bot. ii. 589. *C. falcata*, Schum. et Thonn. Pl. Guin. 335, non Vahl. *C. macrostipula*, Steud. A. Rich. Fl. Abyss. i. 153. *β. angustifolia*, leaflets linear, not more than 2–3 lines broad.

Upper Guinea. Senegambia, *Perrottet! Boteler! Heudelot!* Guinea Proper, *Thonning, Don! Vogel, Barter!*
Nile Land. Nubia, *Kotschy!* Abyssinia, *Schimper! Quartin-Dillon and Petit!*
Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*
β **Upper Guinea.** Sierra Leone, *Afzelius! Smeathmann!* Banks of the Niger, *Barter!* On the beach at Fernando Po, *Mann!*

58. **C. flexuosa,** *Baker.* Stems 12–18 in. long, herbaceous, copiously and diffusely branched, clothed throughout with long spreading silky hairs. Stipules ¼–½ in. long, lanceolate-falcate. Petioles 1–1½ in. long, spreading, silky. Leaves with three sessile oblanceolate leaflets, central 1–1½ in. long, ¼–½ in. broad, upper surface glabrous, lower thinly silky with long hairs. Flowers in lax 6–8-flowered lateral racemes, which about equal the peduncles. Bracts minute, setaceous. Pedicels ⅛ in. long, cernuous. Calyx silky, ⅜ in. long, teeth linear or lanceolate, reaching three-quarters of the way down. Corolla twice as long as the calyx, the standard oblong, the keel with a long beak. Pod ½–⅜ in. long, not quite so thick, round-oblong, sessile, finely-silky, when young glabrescent, 8–9-seeded.

South Central. In the interior near the Tropic, *Chapman and Baines!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
General habit just that of the Cape *C. obscura*, DC., but the flower different and pod shorter.

59. **C. elata,** *Welw. mss.* An erect shrub 2–3 ft. high with woody finely brown-silky terete branches. Stipules linear, semilunate, 3–6 lines. Petioles 6–14 lines. Leaflets 3, oblanceolate-oblong, 12–18 lines long, blunt with a faint mucro, upper surface glabrous when mature, lower finely adpressed brown-silky. Flowers 3–6 together on short leaf-opposed peduncles in a lax raceme 3–4 in. long, 18–21 lines broad. Pedicels 3–4 lines. Calyx 8–9 lines long, clothed with thick brown-silky pubescence, the lanceolate teeth reaching much over half-way down. Corolla yellow, an inch long, the standard 8–9 lines broad, the keel 4 lines deep. Pod subsessile, oblong, 18–20 lines long, 8–9 lines broad, clothed with very dense bright brown silky hairs like those of the calyx.

Lower Guinea. Huilla and Golunga Alto, Angola, *Dr. Welwitsch!*

60. **C. orthoclada,** *Welw. mss.* An erect shrub with numerous straight erecto-patent branches densely clothed with short adpressed grey pubescence. Stipules 0. Petioles 2–4 lines, adpressed to the branches. Leaflets 3, oblanceolate, reaching 12–18 lines long, 3–4 lines broad, blunt with a distinct mucro, glabrous above, finely grey-silky beneath. Flowers 6–12 in lax short-peduncled terminal racemes 8–9 lines broad. Bracts 2–3 lines, linear, silky, deciduous. Pedicels 1–1½ line. Calyx 3–3½ lines, densely grey-silky, the lanceolate teeth

reaching three-quarters down. Corolla bright yellow, half as long again as the calyx, the standard silky on the back. Pod oblong, sessile, an inch long, half an inch broad, 15–20-seeded, finally black, thinly clothed with grey spreading silky hairs.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

61. **C. virgatula,** *Klotzsch in Peters' Mossamb. Bot.* i. 56. Stems suffruticose, 2–3 feet high, with copious ascending curved branches, slightly downy upwards. Stipules very minute. Petioles $\frac{1}{8}$–$\frac{1}{4}$ in. long, slender. Leaves with three sessile oblanceolate leaflets, central $\frac{1}{2}$–$\frac{3}{4}$ in. long, $1\frac{1}{2}$–2 lines broad, mucronate or emarginate, upper surface glabrous, lower slightly silky. Flowers in lax elongated terminal racemes of 6–9 flowers and also solitary in the axils of many of the leaves. Bracts lanceolate, minute. Pedicel $\frac{1}{8}$ in. long, finely silky. Calyx $\frac{1}{4}$ in. long, thinly silky, the teeth reaching three-quarters of the way down, upper lanceolate acuminate, lower linear. Corolla yellowish, twice as long as the calyx, standard $\frac{1}{4}$ in. broad, keel with a long beak. Pod sessile, silky, oblong, 4–6-seeded.

Mozamb. Distr. Mozambique, *Dr. Peters!*

62. **C. florida,** *Welw. mss.* An undershrub with very numerous rigidly erecto-patent slender deeply sulcate branches inconspicuously grey-downy when young. Stipules 0. Petioles 2–3 lines. Leaflets 3, oblanceolate, rather fleshy, rigidly coriaceous when dry, 4–6 lines long, blunt with a faint mucro, green, subglabrous when mature. Flowers very numerous in sessile terminal racemes which extend down among the leaves and form a large thyrsoid panicle. Bracts minute, setaceous. Pedicels 1–$1\frac{1}{2}$ line, finely silky. Calyx $\frac{1}{8}$ in. long, broadly campanulate, finely adpressed silky, the lanceolate-deltoid teeth shorter than the tube. Corolla bright yellow, $\frac{3}{8}$ in. long, the obovate blunt standard 4 lines broad. Pods sessile, globose, subacute, 4 lines long, pointed, 1-seeded.

Lower Guinea. Huilla, Angola, abundant, *Dr. Welwitsch!*

63. **C. Steudneri,** *Schweinf. in Verh. Zool. Bot. Ges. Wien.* xviii. 651. Stem erect, a foot high, branched from the base, hispid throughout. Stipules linear-subulate, $\frac{1}{8}$ in. long. Petioles hispid $\frac{1}{3}$–$\frac{1}{4}$ in. long. Leaflets three, linear, glaucous-green, glabrous above, silky on the veins beneath, central one an inch long, $\frac{1}{8}$ in. broad. Racemes lax-flowered, three or four times as long as the leaves. Bracts equalling the pedicels. Calyx silky, $\frac{1}{8}$ in. deep, exceeding its pedicel, cleft halfway down, teeth deltoid. Corolla pale yellow, the long-beaked keel exceeding the standard and wings, twice as long as the calyx. Pod sessile, roundish-oblong, 4 lines long, 10–14-seeded.

Nile Land. Abyssinia, *Steudner.*

64. **C. maxillaris,** *Klotzsch in Peters' Mossamb. Bot.* 58. Stem 2–3 ft. long, erect, suffruticose, with long suberect branches, finely downy upwards. Stipules minute, setaceous. Petioles 1–$1\frac{1}{2}$ in. slightly silky.

Leaves with three subsessile oblong leaflets, central 1–1½ in. long, ½ in. broad, apex rounded mucronate, glabrous above, slightly silky below. Flowers in many-flowered elongate terminal racemes 6–12 in. long. Bracts minute setaceous. Pedicels ⅛ in. silky cernuous. Calyx ¼ in. long, thinly silky, teeth lanceolate-cuspidate reaching more than half-way down. Corolla yellow, twice as long as calyx; standard ⅜ in. broad, striated, silky outside, the keel long-beaked. Pod sessile, oblong, ⅜ in. long, more than half as thick, very silky, 8–12-seeded. *C. carinata*, Steud. in Schimp. Pl. Abyss. 772 non 519; A. Rich. Fl. Abyss. i. 154 in part.

Nile Land. Banks of the White Nile, *Dr. Brownell!* Abyssinia, *Schimper!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Kirk!*

65. **C. senegalensis,** *Bacle in DC. Prod.* ii. 133. Stem herbaceous, diffuse, copiously branched, 6–18 inches long, finely downy upwards. Stipules minute, deciduous. Petioles half an inch, slender. Leaves with three sessile oblong or oblanceolate leaflets, central 1–1½ in. long, ¼–½ in. broad, acute or rounded and mucronate, upper surface glabrous, lower finely silky. Flowers in copious terminal and lateral long-stalked racemes of 10–30 flowers. Bracts minute, setaceous. Pedicels ⅛ in. long, slender, at first erect, afterwards cernuous. Calyx slightly silky, 2 lines long, the teeth lanceolate, reaching three-quarters of the way down. Corolla bright yellow, twice as long as the calyx, the standard ⅜ in. broad. Pod sessile, 4–6 lines long, half as broad, finely pubescent, 10–12-seeded.—Guill. et Perr. Fl. Seneg. 165. Benth. in Lond. Journ. Bot. ii. 582. *C. macilenta*, Delile, Cent. Pl. Afric. 35, t. 3, fig. 2. *C. remotiflora*, Hochst. in Schimp. Pl. Abyss. No. 2266. *C. carinata*, Steud. in Schimp. Pl. Abyss. 519 non 772.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Brunner!*
Nile Land. Nubia, *Caillaud, Kotschy!* Abyssinia, *Schimper!*
Lower Guinea. Loanda and Benguela, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, Luabo, and Zanzibar, *Dr. Kirk!*
Extends south to Natal (*Gerrard!*) and to the Cape Verde islands.

66. **C. montana,** *A. Rich. Fl. Abyss.* i. 152. Stem erect, 2 ft. high, branched, clothed with long ferruginous hairs. Stipules setaceous, long, acute, silky. Petioles about equalling the obovate leaflets, which are rounded at the apex, glabrous above, slightly pubescent beneath. Flowers in long-stalked 6–8-flowered lax elongate lateral and terminal racemes. Bracts linear; pedicels short; calyx densely clothed with long silky hairs, teeth linear-lanceolate. Corolla scarcely equalling the calyx, standard silky on the back. Pod 2 in. long, terete, cylindrical, very silky.

Nile Land. Abyssinia, *Quartin-Dillon.* Not seen.

67. **C. incana,** *Linn.; DC. Prod.* ii. 132. Herbaceous, annual or biennial, erect, reaching 2–4 ft. in height, the divaricate branches clothed with fine spreading brown silky hairs. Stipules setaceous. minute. Petioles 1–2 in. Leaflets 3, obovate, blunt, reaching 12–18

lines long, glabrescent above, slightly silky beneath. Racemes both lateral and terminal, laxly 6–12-flowered, 2–4 in. long on peduncles 1–4 in. long. Bracts minute, setaceous. Pedicels 1–1½ lines, silky. Calyx ¼ in. long, with two setaceous bracteoles at the base, clothed with spreading brown hairs, the lanceolate teeth reaching three-quarters of the way down. Corolla bright yellow, half as long again as the calyx; standard ¼ in. broad. Pod subsessile, linear-oblong, 12–18 lines long, ⅜–½ in. broad, turgid, clothed with fine spreading hairs like those of the stem, 20–30-seeded.—*C. Schimperi*, A. Rich. Fl. Abyss. i. 151. *Chrysocalyx Schimperi*, Hochst. in Schimp. Pl. Abyss. No. 394.

Upper Guinea. Senegambia, *Perrottet!* Sierra Leone, *G. Don!*
Nile Land. Abyssinia, *Schimper! Petit! Roth!*
Cosmopolitan in the Tropics, but perhaps an introduction in the Old World.

68. **C. Grantii,** *Baker.* Suffruticose, the firm green terete divaricate branches clothed with short grey fine spreading pubescence. Stipules setaceous, 2–3 lines, persistent. Petioles 1–2 inches. Leaflets 3, obovate, reaching 15–18 lines long, 9–10 lines broad, bluntish with a mucro, both sides green, upper glabrous, lower thinly silky. Racemes lateral and terminal, short-stalked, laxly 6–12-flowered. Pedicels ⅛ in., silky. Calyx ⅝–¾ in. long, densely clothed with long spreading brown-silky hairs, with two small lanceolate bracteoles at the base, the lanceolate teeth reaching three-quarters of the way down. Corolla half as long again as the calyx; standard brown-silky on the back. Pod subsessile, linear-oblong, 18–24 lines long, 9–10 lines broad, turgid, clothed with fine pale brown spreading hairs, 30–40-seeded.

Nile Land. Right bank of the Nile in 5° N. lat. (as *C. incana, L.*), *Speke and Grant!*

69. **C. Stewartii,** *Baker.* A sparingly-branched annual, 2–3 ft. high, with moderately robust branches, clothed with fine spreading greyish hairs. Stipules setaceous, persistent, 4–6 lines long. Petioles 1½–2 in. Leaflets 3, oblong or ovate-lanceolate, narrowed gradually from the middle to a cuspidate point, reaching 2–2½ in. long, 9–12 lines broad, membranous, both sides with a few adpressed hairs. Racemes lax, 3–12-flowered, reaching 4–5 in. long, both terminal and lateral. Pedicels ⅛ in. Bracts 0. Calyx 6–7 lines deep, densely clothed with long spreading brown-silky hairs, bibracteolate at the base, the teeth lanceolate, 1½–2 lines broad, reaching three quarters of the way down. Corolla ½ as long again as the calyx, purplish, the standard ⅝ in. broad, thinly silky on the back, the keel narrowed gradually into a long beak. Pod (only seen immature) sessile, oblong, densely brown-silky, 10–12-seeded.

Mozamb. Distr. Zambesi land, *Dr. Stewart!*

70. **C. fulgida,** *Baker.* An erect annual, 12–18 in. high, very copiously branched at the crown of the root; branches 2–3 times forked, clothed with fine spreading grey hairs. Stipules foliaceous,

semilunate, persistent, $\frac{3}{8}$–$\frac{1}{2}$ in. long. Petioles 6–12 lines. Leaflets 3, oblanceolate, the young ones clothed like the stem, the old ones glabrescent, blunt, with a mucro, reaching 12–15 lines long, 2–4 lines broad. Flowers 4–12, in very lax, copious, lateral and terminal, long-and-short-peduncled racemes more than an inch broad. Bracts obsolete. Pedicels 2–3 lines, finely silky. Calyx 4 lines, with a pair of deciduous lanceolate bractlets at the base as long as itself; teeth lanceolate-acuminate, exceeding the tube. Corolla bright yellow, not striated, 8–9 lines long, glabrous; standard ovate, 8–9 lines broad. Ovary distinctly stalked, linear, glabrescent. Pod unknown.

Lower Guinea. Mossamedes, Benguela, in sandy deserts, *Dr. Welwitsch!*

71. **C. lachnocarpa.** *Hochst. in Schimp. Pl. Abyss.* 780. Stem 3–6 ft. high, suffruticose, branched, deeply striate, densely clothed with long bright brown silky hairs. Stipules $\frac{1}{2}$ in. subfalcate, acute, persistent. Petioles $\frac{1}{2}$–1 in. long. Leaves with three oblong-obovate subsessile leaflets, central $1\frac{1}{2}$–3 in. long, $\frac{1}{2}$–1 in. broad, both sides thinly silky. Flowers in dense usually terminal racemes, sometimes 6 in. long. Pedicels $\frac{1}{4}$ in., very silky. Calyx $\frac{1}{2}$–$\frac{3}{4}$ in. long, densely tomentose, cut three quarters of the way down, upper lobes oblong-lanceolate, lower longer and narrower. Corolla bright yellow, half or a third as long again as the calyx; petals very thick, standard $\frac{1}{2}$–$\frac{5}{8}$ in. broad. Pod sessile, 1–$1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. thick, densely clothed with close-spreading bright brown silky tomentum, 16–18-seeded. *C. lachnophora*, A. Rich. Fl. Abyss. i. 151.

Upper Guinea. Niger country, Nupe, *Barter!*
Nile Land. Abyssinia, *Schimper! Quartin-Dillon!* and others.
Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

72. **C. decumbens,** *Welw. mss.* Annual with trailing moderately-branched stems reaching 2 ft. long, densely clothed upwards with spreading brownish hairs. Stipules semilunate, foliaceous, 3–4 lines long. Petioles spreading, 3–6 lines. Leaflets 3, oblanceolate, the central one 12–21 lines long, subacute, mucronate, both sides green, with a few short adpressed grey hairs. Flowers 6–10, in close long-peduncled terminal heads. Bracts linear, 3–4 lines. Pedicels downy, $1\frac{1}{2}$–2 lines. Calyx 3 lines, downy, the lanceolate teeth as long as the tube. Corolla twice the calyx, yellowish; keel purplish. Ovary linear, sessile, silky, multiovulate.

Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

73. **C. uncinata,** *Welw. mss.* Herbaceous, diffuse, $1\frac{1}{2}$–2 feet high, with finely grey-downy branches 2–3 times forked; branchlets erecto-patent. Stipules minute, setaceous. Petioles 6–12 lines. Leaflets 3, lanceolate-oblong, narrowed gradually to a mucronate point, glabrous above, faintly grey-downy below, the central one reaching 12–18 lines long, 5–8 lines broad. Flowers up to 20–25 in copious lax usually terminal racemes reaching 6–8 in. long, and an inch broad. Bracts a

line long, setaceous, persistent. Pedicels 2–3 lines, finely grey-downy. Calyx $\frac{1}{8}$ in., finely grey-downy, the lanceolate-acuminate teeth exceeding the tube. Corolla 4 lines, yellow, the standard conspicuously striated with purple, the keel abruptly hooked. Pod distinctly stalked, linear, 12–15 lines long, $3\frac{1}{2}$–4 lines broad, finely grey-downy, glabrescent, 20–30-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

74. **C. comosa,** *Baker.* An erect annual, 2–3 ft. high, with erect short unbranched or sparingly-branched stout sulcate stems finely brown-silky throughout. Stipules 0. Petioles 1–2 in. long. Leaflets 3, shortly-stalked, oblanceolate or oblanceolate-oblong, reaching 3–4 in. long, 3–12 lines broad, blunt with a mucro, green and glabrescent above, glaucous and finely silky beneath. Flowers in very dense terminal heads reaching 6–9 in. long, 8–9 lines broad, comose in bud with the setaceous bracts, which are 3–4 lines long, silky and persistent. Pedicels $\frac{1}{2}$–1 line long, densely brown-silky. Calyx 2–$2\frac{1}{2}$ lines, densely silky, with a setaceous bracteole at the base as long as itself, the linear teeth equalling the tube. Corolla bright yellow, nearly twice the calyx, both keel and standard very conspicuously streaked with purple. Pod sessile linear-oblong, 6–7 lines long, $2\frac{1}{2}$ lines broad, finely silky, 12–15-seeded.

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

75. **C. natalitia,** *Meissn. in Hook. Lond. Journ.* ii. 67. Suffruticose, erect, with numerous long erecto-patent straight finely grey-downy branches. Stipules foliaceous, persistent, semilunate, $\frac{1}{4}$–$\frac{3}{8}$ in. Petioles 4–8 lines, erecto-patent. Leaflets 3, reaching an inch long, upper linear or oblanceolate, 2–3 lines broad, lower obovate-oblong, upper surface glabrescent, lower finely grey-downy. Flowers 6–10 in copious lax short-peduncled terminal racemes 12–15 lines broad. Bracts linear, 2–3 lines, soon falling. Pedicels 3–4 lines, erecto-patent, finely downy. Calyx 4 lines, downy, the lanceolate teeth exceeding the tube. Corolla twice the calyx, dull reddish in the dried plant; standard 8–9 lines broad. Ovary short-stalked, linear, glabrous, multiovulate. Pod unknown (in the Natal plant linear-oblong, 12–15 lines long, 5–6 lines broad).—Harv. Fl. Cap. ii. 46.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

76. **C. platysepala,** *Harv. Thes. Cap.* t. 29. Shrubby, with finely grey-downy slender branches. Stipules minute, setaceous. Petioles 4–6 lines. Leaflets 3, oblanceolate, green and glabrous above, finely grey-downy below, blunt with a mucro, the central one 8–9 lines long. Flowers 10–30 in lax peduncled terminal racemes, reaching 5–6 in. long, an inch broad. Bracts setaceous, very minute. Pedicels $1\frac{1}{2}$–2 lines, finely grey-downy. Calyx 2 lines, finely grey-downy, the teeth, which reach over halfway down, oblanceolate-spathulate with a distinct cusp. Corolla bright yellow, 4–$4\frac{1}{2}$ lines, not streaked; the standard

slightly downy on the back. Ovary linear, sessile, finely downy, multiovulate.—Harv. Fl. Cap. ii. 43.

South Central. Banks of Lake Ngami, *McCabe!*

77. **C. emarginata,** *Bojer; Benth. in Lond. Journ. Bot.* ii. 584. Stem erect, suffruticose, striate, densely clothed with short grey pubescence. Stipules none. Petioles $\frac{1}{2}$ in., erect, silky. Leaves with three sessile oblanceolate leaflets, $\frac{3}{4}$ in. long, $\frac{1}{4}$—$\frac{3}{8}$ in. broad, conspicuously emarginate, densely silky on both sides. Flowers in stalked many-flowered terminal racemes 2–3 in. long. Bracts minute. Pedicels silky, 1 line long. Calyx silky, broadly and obliquely campanulate, 2 lines deep, teeth lanceolate-acuminate, about equalling the tube. Corolla three times as long as the calyx, bright yellow, conspicuously striated, standard 4 lines broad, keel beaked and much upcurved. Ovary villose, multiovulate. Pod unknown.—*C. cylindrica*, A. Rich. Fl. Abyss. i. 154?

Mozamb. Distr. Island of Pemba, north of Zanzibar, *Bojer!*

The description of the Abyssinian *C. cylindrica*, which I have not seen, agrees with this as far as it goes.

78. **C. protensa,** *Welw. mss.* Stems suffruticose trailing 2–4 ft. long, the outer branches ascending, slender, finely grey-silky. Stipules setaceous. Petioles 6–9 lines. Leaflets 3, oblong-lanceolate, acute, subcoriaceous, glabrous above, clothed with short adpressed grey hairs beneath, the central one 2–3 in. long, 8–12 lines broad, the uppermost leaves casually simple. Flowers 6–12 in moderately dense long-peduncled terminal racemes. Bracts linear, 2–3 lines. Pedicels 3–4 lines, finely grey-downy. Calyx 5 lines long, coriaceous, densely adpressed grey-silky, the lanceolate teeth reaching three-quarters of the way down. Corolla bright yellow, slightly exceeding the calyx, the orbicular pointed standard $\frac{1}{2}$ in. broad, a little silky on the back. Ovary linear-oblong, sessile, densely brown-velvety. Pod not seen.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 feet, *Dr. Welwitsch!*

79. **C. zanzibarica,** *Benth. in Lond. Journ. Bot.* ii. 584. Stem suffruticose, erect, prominently striate, clothed with dense short grey pubescence. Stipules none. Petioles $\frac{3}{4}$ in. long, slender, spreading, pubescent. Leaves with three oblanceolate leaflets, central $1\frac{1}{2}$ in. long, $\frac{1}{2}$ in. broad, point rounded slightly mucronate, upper surface dark green, glabrous, lower paler, densely but finely silky. Flowers 12–20 in lax many-flowered terminal racemes. Bracts minute. Pedicels $\frac{1}{8}$ in. silky, spreading. Calyx silky on the back, the rest nearly glabrous, obliquely campanulate, not more than $\frac{1}{8}$ in. deep, the teeth deltoid mucronate, one-third as long as the tube. Corolla bright yellow, $\frac{1}{2}$ in. long, standard $\frac{3}{8}$ in. broad, the keel with a long beak. Ovary densely silky. Pod unknown.

Mozmb. Distr. Island of Zanzibar, *Bojer!*

80. **C. lathyroides,** *Guill. et Perr. Fl. Seneg.* i. 163. Stem herbaceous, about 2 ft. high, with copious glabrous terete ascending branches.

Stipules obsolete. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaflets 3, linear, 1–$1\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, both sides glabrous. Flowers in lax 6–12-flowered racemes, terminal on the stem and branches. Pedicel about equalling the calyx, which is $\frac{1}{8}$ in. deep, teeth linear, not reaching quite halfway down. Corolla under $\frac{1}{4}$ in. long; standard ovate, acute, yellow, veined with reddish, keel with a long beak. Pod sessile, linear, $\frac{1}{2}$ in. long, 2 lines thick, glabrous, slightly upcurved.—*C. Afzelii*, R. Br. mss. in Herb. Brit. Mus.

Upper Guinea. Senegambia, *Perrottet!* Sierra Leone, *Afzelius!*

81. **C. lanceolata,** *E. Meyer. Comm. Pl. Afr. Aust.* 24. Stem suffruticose, 2–6 ft. high, with a few long straight erecto-patent branches, upper part slightly pubescent. Stipules none. Petioles 1–2 in. long, slender, erecto-patent, glabrous. Leaves with three linear subsessile leaflets, central 2–4 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, narrowed to both ends, mucronate, both surfaces nearly glabrous. Flowers in long-stalked lax many-flowered racemes terminal on the main stem and branches, sometimes 6 in. long, 1 in. broad. Pedicels 2 lines long. Bracts very small, ovate-mucronate. Calyx campanulate, thinly silky, $\frac{1}{8}$ in. long, teeth deltoid-mucronate, not more than half as long as the tube. Corolla $\frac{1}{2}$ in. long, petals bright yellow, striated with purple, standard 3 lines broad, keel about the same breadth with the point much upcurved. Pod cylindrical, sessile, very silky when young, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, 2 lines thick, ultimately black and glabrous.—Benth. in Lond. Journ. Bot. ii. 585. Harv. Fl. Cap. ii. 43. *C. mossambicensis*, Klotzsch in Peters' Mossamb. Bot. 61 t. 10.

Nile Land. Zungomero and banks of the Nile at Chopeh, *Speke and Grant!*
Mozamb. Distr. Mozambique, *Peters!* Zambesi, *Dr. Kirk!*
Also a plant of Mauritius, Natal, and Cape Colony. It may be *C. pallida*, Aiton, DC. Prod. ii. 134. *C. cleomoides*, Klotzsch l.c., is apparently a form of this, with the calyx-teeth rather longer and more cuspidate than in the type.

82. **C. tigrensis,** *Baker.* A low copiously-branched shrub with woody ascending glabrous branches. Stipules obsolete. Petioles firm, $1\frac{1}{2}$–2 lines long. Leaflets 3, oblanceolate, 5–6 lines long, $1\frac{1}{2}$–2 lines broad, emarginate, subcoriaceous, glabrous. Flowers in short-stalked moderately lax 6–12-flowered terminal racemes. Pedicels $\frac{1}{2}$–1 line long, thinly silky. Bracts lanceolate, very minute. Calyx broadly campanulate, $\frac{1}{8}$ in. deep, thinly silky, the lanceolate teeth reaching nearly half down. Corolla $\frac{3}{8}$ in. deep, bright yellow; the standard 3 lines broad, the keel much incurved. Pod sessile, linear, glabrous, 8–9 lines long, $\frac{1}{8}$ in. thick, 6–8-seeded.

Nile Land. Abyssinia, *Schimper!*

83. **C. Kirkii,** *Baker.* Stem suffruticose, erect, prominently striate, slightly adpressed grey-silky upwards, with a few long ascending branches. Stipules none. Petioles 1–$1\frac{1}{2}$ in. long, straight, slightly silky. Leaves with 3 linear subsessile leaflets, central 3–4 in. long, 2–4 lines broad, mucronate, green and glabrous above, subglaucous,

thinly adpressed grey-silky beneath. Flowers in long-stalked terminal racemes finally 4–5 in. long. Pedicels erecto-patent, 2 lines long. Calyx broadly campanulate, membranous, glabrous, about a line deep, teeth subulate, dilated at the base, shorter than the tube. Corolla apparently yellowish, distinctly veined; standard $\frac{1}{4}$ in. broad, roundish with a mucro, wings $\frac{1}{8}$ in. broad, both considerably shorter than the keel, which is nearly $\frac{1}{2}$ in. round at the broadest part, 6–7 lines long, narrowed gradually to a long upcurved point, the edges and the lower part of the back a little ciliated. Ovary linear, multiovulate. Pod not seen.

Mozamb. Distr. Island of Zanzibar, *Dr. Kirk!*
General habit of *C. lanceolata*, from which it differs in calyx and corolla.

84. **C. intermedia,** *Kotschy in Sitzungsb. Acad. Wien.* 1864, 362 t. 3. An erect sparingly-branched annual 2–3 ft. high, with firm terete straight erecto-patent subglabrous branches. Stipules 0. Petioles 1–2 in. Leaflets 3, shortly-stalked, linear, green, subglabrous, reaching 4–6 in. long, 3–6 lines broad. Flowers in a few very lax terminal racemes reaching 6–12 in. long, 15–18 lines broad. Bracts linear, minute. Pedicels $1\frac{1}{2}$–2 lines, slightly grey-downy. Calyx 2 lines, broadly campanulate, subglabrous, the deltoid acuminate teeth shorter than the tube. Corolla bright yellow, 8–9 lines; the pointed standard $\frac{5}{8}$ in. broad, very conspicuously veined with purple. Pod subsessile, linear, $1\frac{1}{2}$–2 in. long, $\frac{1}{2}$ in. broad, glabrescent, 20–30-seeded.

Nile Land. Banks of the White Nile near Goudokoro, *Knoblecher.* Unyoro in fallows and grassy ground, *Speke and Grant!*

Lower Guinea. Golungo Alto, in fields of Phaseolus, *Dr. Welwitsch!*

We have imperfect specimens of a closely-allied plant, with a similar calyx and corolla, but with a shrubby stem and much shorter leaflets, gathered by Mr. Consul Petherick, on the White Nile.

85. **C. ochroleuca,** *G. Don, Gard. Dict.* ii. 138. Stem suffruticose, 2–3 ft., erect, terete, with long ascending branches. Stipules deciduous. Petioles $1\frac{1}{2}$ in., spreading, glabrous. Leaflets 3, linear, subsessile, 2–$3\frac{1}{2}$ in. long, 4–5 lines broad, both sides glabrous. Flowers in moderately lax 6–12-flowered racemes terminal on the main stem and branches. Pedicel $\frac{1}{8}$ in., with a minute bract at the base. Calyx campanulate, nearly $\frac{1}{4}$ in. deep, teeth linear, not more than a quarter as long as the tube. Corolla pale yellow; standard $\frac{5}{8}$ in. long, $\frac{3}{8}$ in. broad, narrowed to a point, keel with a long beak. Pod linear-oblong, $1\frac{1}{4}$ in. long, $\frac{3}{8}$ in. thick, glabrous, sessile.

Upper Guinea. Island of St. Thomas, *G. Don in Herb. Brit. Mus.!*

86. **C. brevidens,** *Benth. in Lond. Journ. Bot.* ii. 585. Stem herbaceous, erect, striate, slightly branched, nearly glabrous. Stipules minute, setaceous or obsolete. Petioles $\frac{1}{2}$–$\frac{3}{4}$ in., glabrous, erecto-patent. Leaves with three subsessile linear leaflets, central 2–3 in. long, $\frac{1}{4}$ in. broad, narrowed to both ends, mucronate, upper surface quite and the lower nearly glabrous. Flowers in elongate few-flowered

nearly sessile terminal racemes. Bracts linear, minute. Pedicels 2 lines long, at first erect. Calyx broadly campanulate, 2 lines deep, glabrous, the teeth not more than one-third as long as the tube. Corolla $\frac{5}{8}$–$\frac{3}{4}$ in. long, striate, the standard roundish, more than $\frac{1}{2}$ in. broad, the keel much less curved than usual. Pod sessile, cylindrical, $1\frac{1}{2}$ in. long, $\frac{1}{4}$ in. thick, glabrous, many-seeded.

Nile Land. Nubia, *Kotschy!*

87. **C. capensis,** *Jacq. Hort. Vind.* t. 64. Stem suffruticose, 3–4 ft. high, erect, copiously branched, the branches firm, terete, subglabrous. Stipules obovate, emarginate, deciduous, $\frac{1}{4}$–$\frac{3}{4}$ in. long. Petioles 1–$1\frac{1}{2}$ in. long, glabrous. Leaflets three nearly sessile obovate, central one $\frac{3}{4}$–$1\frac{1}{2}$ in. long by more than half as broad, the point rounded and mucronate, both sides nearly glabrous. Flowers 6–20 in lax short-stalked terminal and lateral racemes. Bracts small, linear, deciduous. Pedicels 3–4 lines, thinly silky. Calyx obliquely campanulate, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, nearly glabrous, teeth reaching about halfway down, lowest lanceolate, the others broader. Corolla bright yellow, an inch deep. Pod distinctly stalked, 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$ in. thick, finely silky when young.—Benth. in Lond. Journ. Bot. ii. 590. Harv. Fl. Cap. ii. 46. *C. arborescens,* Lam.; DC. Prodr. ii. 130.

Nile Land. Lat. 5° S., 33° E.; altitude 3800 ft; in open forest, *Speke and Grant!*
A common Cape species.

88. **C. striata,** *DC. Prodr.* ii. 131. Stem 1–3 ft. high, suffruticose, erect, the young branches slightly grey-silky. Stipules minute, setaceous, deciduous. Petioles $1\frac{1}{2}$–3 in. Leaflets 3, oblong or obovate-oblong, shortly-stalked, the central one reaching 2–3 inches long, 12–18 lines broad, blunt with a minute mucro, both sides green, the lower at first slightly silky. Flowers in moderately dense terminal racemes reaching 6–9 in. long, 15–18 lines broad. Bracts setaceous, deciduous, 2–3 lines long, silky. Pedicels 1–$1\frac{1}{2}$ lines, finely-silky. Calyx $\frac{1}{4}$ in. long, the lanceolate-acuminate teeth equalling the tube. Corolla bright yellow, twice the calyx. Pod linear, distinctly stalked, 12–18 lines long, $2\frac{1}{2}$–3 lines broad, glabrescent, about 20-seeded.—Bot. Mag. t. 3200. *C. Saltiana,* Andr. Bot. Rep. t. 648. *C. pisiformis,* Guill. et Perr. Fl. Seneg. 162. *C. pallida* and *laburnoides,* Klotzsch in Peters' Mossamb. Bot. 57.

Upper Guinea. Senegambia, *Perrottet!* Island of St. Thomas, *G. Don!* Jeba on the Quorra, *Barter!*
Nile Land. Nubia, *Kotschy!* Abyssinia, *Salt!* At 5° S. lat., 33° E. long. 3800 ft., *Speke and Grant!*
Lower Guinea. Benguela, *Wawra!* Loanda and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Kirk!* *Dr. Stewart!*
Also a plant of Natal, the Mascarene isles, Tropical Asia, and America.

89. **C. glaucifolia,** *Baker.* Herbaceous, erect, 2–3 ft. high, with numerous erecto-patent branches, only the young ones inconspicuously

grey-pubescent. Stipules linear, 6–9 lines, persistent. Petioles reaching 2–2½ in. Leaflets 3, shortly-stalked, obovate, 1½–3 in. long, 12–18 lines broad, blunt with a faint mucro, glaucous, glabrous. Flowers in lax terminal racemes reaching a foot long. Bracts minute, setaceous, deciduous. Pedicels 2–3 lines. Calyx subglabrous, ⅜ in. the tube very shallow, the teeth linear-lanceolate. Standard violet-blue internally, slightly exceeding the calyx; wings and keel sulphur-yellow, shorter. Ovary short-stalked, linear-oblong, thinly grey-silky. Pod unknown.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 ft., *Dr. Welwitsch!*

90. **C. Lotononis,** *Welw. mss.* Herbaceous, diffuse, glabrous, copiously branched, a foot or more high. Stipules 3–5 lines, setaceous, persistent. Petioles 9–15 lines. Leaflets 3, rather fleshy, glabrous, subcoriaceous when dried, lanceolate, subacute or bluntish with a mucro, reaching 18–21 lines long, the upper ¼–⅜, the lower ½ in. broad. Flowers up to 12–18 in copious lax short-peduncled lateral and terminal subsecund racemes. Bracts 1½ line, setaceous, persistent. Pedicels 1½–2 lines, glabrous, cernuous. Calyx ⅜ in., glabrous, the lanceolate teeth exceeding the tube. Corolla glabrous, reddish when dried, just equalling the calyx. Ovary short-stalked, linear, glabrous, ovules about 20. Pod unknown.

Lower Guinea. Pungo Andongo, Angola, in damp sand, *Dr. Welwitsch!*

91. **C. cyanea,** *Baker.* A perfectly glabrous erect annual under a foot high with a few open very slender branches. Stipules minute, setaceous. Petioles 1–2 in. Leaflets 3, lanceolate, 12–21 lines long, 4–8 lines broad, subacute, those of the lower leaves shorter and blunter. Flowers 4–6 in very lax lateral and terminal distinctly-stalked racemes. Bracts minute, setaceous. Pedicels in flower 1½–2 lines, finally 3–4 lines, cernuous. Calyx ¼ in., the linear teeth reaching down nearly to the base. Corolla whitish-green, the standard violet, just as long as the calyx. Pod linear-oblong, with a pedicel as long as the calyx, 9–10 lines long, ⅜ in. broad, glabrous without and within, thin, 18–20-seeded.

Lower Guinea. Huilla, Benguela, 5500 ft., in pastures, *Dr. Welwitsch!*

92. **C. lupinoides,** *Hochst. in Herb. Kotschy Nub. No.* 41. Stem suffruticose, the branches long, spreading, curved, upper part thinly silky. Stipules none. Petioles about 1 in. long, glabrous, spreading. Leaflets three subsessile oblong-obovate, central 1–1½ in. long, ½–¾ in. broad, upper surface glabrous, the lower thinly silky. Flowers in elongate many-flowered lax stalked terminal and lateral racemes, the main ones ultimately 8–12 in. long. Bracts minute, setaceous. Pedicels silky, cernuous, ⅛ in. long. Calyx slightly silky, 2–3 lines deep, teeth lanceolate, reaching about halfway down. Corolla bright yellow, not striated, ½ in. deep. Pod short-stalked, cylindrical, much curved upwards, 8–10 lines long, under ¼ in. thick, silky on the outside, and

within filled with entangled fine silky hairs.—Benth. in Lond. Journ. Bot. ii. 583.

Nile Land. Nubia, *Kotschy! Schweinfurth!*

Distinguished from all the other species by the pod being filled with wool, so that it is most likely the *C. farcta*, mentioned by name only by R. Brown in Salt's Travels.

93. **C. cylindrocarpa,** *DC. Prod.* ii. 133. Stem suffruticose, erect, branched from the base, 1½–2 ft. high, slightly downy. Stipules ¼–½ in. long, erect, semilunate, persistent. Petioles spreading, 1–1½ in. long. Leaflets three elliptic-oblong, pale green, scarcely pubescent beneath, narrowed towards the base and about as long as the petiole. Flowers in lateral and terminal racemes. Calyx silky, cut down to a shallow cup, teeth linear-lanceolate. Corolla yellow, middle sized; standard ¼ in. long, oval, striate. Pod sessile, oblong-cylindrical, subcompressed, an inch long, short-silky, 10–12-seeded.—Guill. et Perr. Fl. Seneg. 164.

Upper Guinea. Senegambia, *Perrottet! Roger!* Guinea, banks of the Gaboon, *Duparquet* (*fide Baillon*).

94. **C. recta,** *Steud. in Schimp. Hb. Abyss. No.* 1083. Stems suffruticose, 2–3 ft. high, only thinly silky when young, soon quite glabrous. Stipules 2–3 lines, linear, persistent. Petioles 9–12 lines. Leaflets 3, shortly-stalked, glaucous, glabrous, obovate, reaching 2½–3 in. long, 12–15 lines broad, blunt with a mucro. Flowers in moderately lax terminal racemes reaching a foot long. Bracts linear, persistent, 2–3 lines. Pedicels 2–4 lines. Calyx ⅜ in. broadly campanulate, glabrous, the teeth equalling the tube, the upper ones deltoid, the lower lanceolate. Corolla ½ in. long, the standard exceeding the wings and keel. Pod subsessile, 18–21 lines long, ½ in. thick, turgid, glabrescent, 20–24-seeded.—Ferret et Gal. Voy. Abyss. 121, t. 10. *C. simplex*, A. Rich. Fl. Abyss. i. 153.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*
Mozamb. Distr. Zambesi land, *Dr. Kirk! Waller!*

95. **C. falcata,** *Vahl; DC. Prodr.* ii. 132. Stem fruticose, 2–3 ft. high, diffusely and divaricately branched, slightly silky upwards. Stipules none. Petioles 1 in. long. Leaflets 3, obovate subsessile, central 1–1½ in. long, ¾–1 in. broad, apex rounded mucronate, upper surface glabrous, lower slightly silky in the young plant. Flowers in long-stalked lax terminal and lateral racemes. Bracts minute. Pedicels 1 line long, silky, erecto-patent. Calyx slightly silky, ¼ in. long, the teeth lanceolate, reaching about halfway down. Corolla yellow, rather more than twice as long as the calyx, keel much upcurved. Pod sessile, cylindrical, 1–1½ in. long, ¼ in. thick, very silky when young, 15–20-seeded.—Benth. in. Lond. Journ. Bot. ii. 585. *C. striata*, Schum. et Thon. Pl. Guin. 336, non DC. ?

Upper Guinea. Niger country, *Ansell! Vogel!* More shrubby than *C. striata*, with shorter petioles, smaller flowers, and broader leaflets.

96. **C. fertilis,** *Delile in Ferr. et Gall. Voy. Abyss.* 122, t. 11. Stem suffruticose, dichotomously branched. Stipules none. Petioles 1½–3 in. long. Leaflets 3, obovate, central 2–4 in. long, 1½–2 in. broad. Flowers in long-stalked lax terminal racemes. Bracts nearly obsolete. Calyx broadly campanulate, cut halfway down, teeth lanceolate. Corolla as large as in *C. recta*, but standard narrower and more pointed and keel more distinctly rostrate. Pod sessile, glabrous, linear, 1½–2 in. long, ¼–⅜ in. thick.

Nile Land. Abyssinia, *Ferret and Gallinier;* and a plant gathered by Speke and Grant, in lat. 5° S., long. 33° E., probably belongs here.

97. **C. Dilloniana,** *Baker.* A short erect subglabrous herb with only the young branches finely grey-pubescent. Stipules 0. Petioles 12–21 lines. Leaflets 3, oblanceolate, glabrous, pale green, shortly-stalked, the central one reaching 3–3½ in. long, an inch broad, acute with a mucro. Flowers in dense elongated terminal racemes, finally half a foot long. Bracts 3–4 lines, setaceous, persistent. Pedicels 1–1½ lines, finely silky. Calyx ¼ in., bracteolate at the base, the three upper teeth linear, exceeding the tube, the lower ones shorter. Corolla yellow, slightly exceeding the calyx, the standard with many dark purple veins. Pod deflexed, sessile, linear, 9–10 lines long, 2 lines broad, finely grey-silky, slightly upcurved, 15–20-seeded.—*Chrysocalyx Quartiniana,* A. Rich. Fl. Abyss. i. 159.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Schweinfurth!*

98. **C. oligostachya,** *Baker.* An erect sparingly-branched annual 1½–2 feet high, with slender stems only very inconspicuously grey-pubescent upwards. Stipules 0. Petioles 9–15 lines. Leaflets 3, lanceolate or of the lower leaves obovate-oblong, blunt with a mucro, both sides subglabrous, reaching 1½–2 in. long, the upper 3–6, the lower 8–9 lines broad. Flowers 20–50 in dense long-peduncled terminal racemes 7–8 lines broad. Bracts setaceous, very minute. Pedicels ½ line, finely downy. Calyx ⅛ in., campanulate, finely downy, the deltoid or lanceolate-acuminate teeth as long as the tube. Corolla ¼ in. long, bright yellow; the round pointed glabrous standard very conspicuously veined with purple. Ovary linear, sessile, finely grey-downy, with 20 ovules or more. Pod unknown.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

99. **C. Plowdeni,** *Baker.* Stems herbaceous, finely grey-downy upwards. Stipules 0. Petioles 6–8 lines. Leaflets 3, subsessile, linear-ligulate, glabrescent, green, the central one 1½–2 inches long, 2–4 lines broad, acute. Flowers in dense oblong-conical terminal heads. Bracts minute, setaceous, persistent. Pedicels 1 line, densely grey-downy. Calyx 2 lines, finely grey-downy, the linear teeth exceeding the tube. Corolla bright yellow, half as long again as the calyx, all the petals conspicuously veined with purple. Ovary linear, sessile, finely grey-silky. Pod not seen.

Nile Land. Abyssinia, *Plowden!*

100. **C. lotifolia,** *Linn.; DC. Prod.* ii. 134. Fruticose, with straight finely grey-silky branches. Stipules minute, setaceous, deciduous. Petioles 1½–2 in., erecto-patent. Leaflets 3, obovate-oblong, glabrous above, finely grey-silky below, bluntish, emarginate or faintly mucronate, reaching 2–3 in. long, 12–18 lines broad. Flowers 1–4 together in the axils of many of the leaves, if more than one racemose or umbellate. Pedicels 3–6 lines. Bracts linear, very minute. Calyx ⅜ in., finely grey-silky, the lanceolate teeth exceeding the tube. Corolla nearly twice the calyx, yellow, faintly veined. Pod distinctly-stalked, glabrescent, 1½–2 in. long, ½ in. broad, 12–15-seeded.

Upper Guinea. Cape Coast, *Dr. Vogel!*
Lower Guinea. Congo, *Dr. Welwitsch!*
A well-known very distinct West India species.

101. **C. platycalyx,** *Steud. in Schimp. Hb. Abyss.* No. 860. Stem 2 ft. high, herbaceous, erect, slightly branched, thinly silky upwards. Stipules ¼ in. long, spreading, setaceous, persistent. Petioles 1½–2 in. long, slender, erecto-patent, slightly silky. Leaflets 3, subsessile, the central one 2–2½ in. long, 1½ in. broad, acuminate, both sides nearly glabrous. Flowers in few-flowered lax stalked lateral racemes. Pedicel ½ in. long, erecto-patent, with two small lanceolate bracteoles at the base and two large ovate bracteoles below the calyx. Calyx slightly silky, ⅜ in. deep, teeth foliaceous, reaching three-quarters of the way down, the three lower ones lanceolate-spathulate, 2 lines broad, two upper ones nearly twice as broad, straight on the lower, broadly rounded on the upper side. Corolla yellow; keel long-beaked and much upcurved. Pod long-stalked, oblong-cylindrical, 1¼–1½ in. long, ⅜ in. broad, glabrous, many-seeded.—*Phyllocalyx Quartinianus,* A. Rich. Fl. Abyss. i. 160, t. 34.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*

102. **C. Quartiniana,** *A. Rich. Fl. Abyss.* i. 158. Stem a foot long. herbaceous, with diffuse spreading branches, thinly clothed with spreading silky hairs. Stipules minute, setaceous. Petiole 1½ in., silky, herbaceous. Leaflets 3, subsessile broad-oblong, central 1½ in. long, ¾–1 in. broad, acuminate, the upper surface glabrous, lower thinly silky. Flowers in lax long-stalked lateral racemes of 3–4 flowers each. Bracts lanceolate-acuminate, ⅜–1 in. long. Calyx ½ in. long, teeth lanceolate, foliaceous, reaching three-quarters of the way down, two upper ones ⅛ in. broad, oblique. Corolla reddish, slightly exceeding the calyx; standard ⅜ in. broad. Pod glabrous, with a pedicel ¼ in. long, 1–1¼ in. long, ⅜–½ in. thick.

Nile Land. Abyssinia, *Quartin-Dillon. Roth!*
Habit of *C. orixensis* and *curtipoda*, but the pod longer, and flowers larger.

103. **C. polysperma,** *Kotschy in Schweinf. Reliq. Kots.* 18, t. 14. Herbaceous, densely rufo-villose. Stipules linear, 3 lines. Petioles

as long as the leaves. Leaflets 3, shortly-stalked, obovate-oblong, acute, mucronate, both sides silky, the central one 2 in. long. Flowers 6–8 in lax long-peduncled lateral racemes. Bracts linear, 2–3 lines. Pedicels 1½–2 lines, densely silky. Calyx 6–8 lines long, with a pair of small lanceolate bracteoles at the base, densely silky, the lanceolate teeth reaching three-quarters of the way down. Corolla equalling the calyx; standard roundish, densely silky on the back. Ovary linear, sessile, silky, ovules 20 or more. Pod unknown.

Nile Land. Banks of the White Nile, *Von Harnier*.

104. **C. astragalina,** *Hochst. in Schimp. Hb. Abyss.* No. 808. Stems about a foot long, slender, herbaceous, copiously and diffusely branched, slightly silky upwards. Stipules obsolete. Petioles ½–1 in. long, erecto-patent, glabrous. Leaflets 3 subsessile oblanceolate, central 1–1½ in. long, ¼ in. broad, mucronate, upper surface glabrous, lower slightly silky. Flowers in copious long-stalked dense lateral racemes of 6–12 each. Bracts minute. Pedicel 1 line, cernuous. Calyx thinly silky, ⅛ in. deep, teeth lanceolate-acuminate, reaching halfway down. Corolla ¼ in. long; standard yellow, conspicuously veined with purple, keel sharply upcurved. Pod sessile, cylindrical, ½–⅝ in. long, 2 lines thick, silky when young, 10–14-seeded.—A. Rich. Fl. Abyss. 155. *C. striata*, A. Br. in Flora, 1841, 280 non DC. *C. impressa*, Nees. Cat. Sem. Wrat. 1841, 3 ?

Nile Land. Nubia, *Ehrenberg* (*fide Schweinfurth*). Abyssinia, *Schimper!* *Quartin-Dillon.*

105. **C. pycnostachya,** *Benth. in Lond. Journ. Bot.* ii. 584. Stem herbaceous, 12–18 in. high, erect, simple or with several spreading branches, striate, finely silky upwards. Stipules minute, setaceous. Petioles ½ in., spreading, glabrous. Leaflets 3 sessile, oblanceolate, central 1–1¼ in. long, ¼–⅜ in. broad, mucronate, both sides glabrous or nearly so. Flowers 20–50 in dense nearly sessile lateral racemes 2–3 in. long. Bracts long, setaceous, deciduous. Pedicels glabrous, very short, cernuous. Calyx campanulate, glabrous, 1 line deep, upper teeth triangular, reaching about halfway down, lower lanceolate. Corolla bright yellow, not striate, 2 lines long; standard roundish, ⅛ in. broad, keel short beaked, much upcurved. Pod subsessile, oblong-cylindrical, ⅜ in. long, finely downy, about 10-seeded.—*C. melilotoides*, Steud. A. Rich. Fl. Abyss. i. 155.

Nile Land. Nubia, *Kotschy! Cienkowsky.* Abyssinia, *Schimper! Quartin-Dillon.*

A well-marked species, with racemes like those of *Melilotus officinalis*.

106. **C. cleomifolia,** *Welw. mss.* Suffruticose, 2½–3 ft. high, the stout branches inconspicuously grey-silky. Stipules 0. Petioles 12–18 lines. Leaflets 5, short-stalked, oblong or oblanceolate-oblong, glabrous above, finely grey-silky below, the central one reaching 3–3½ in. long, 12–15 lines broad, narrowed gradually to a faintly mucronate

point, the outermost pair much smaller than the other three. Flowers very numerous, in moderately dense short-peduncled terminal racemes reaching 5–6 in. long, 15–18 lines broad. Bracts minute, setaceous. Pedicels $1\frac{1}{2}$–2 lines, finely grey-silky. Calyx $2\frac{1}{2}$–3 lines, the lanceolate-deltoid teeth shorter than the tube. Corolla bright uniform yellow, more than twice the calyx. Pod distinctly-stalked, linear, 15–18 lines long, 3–$3\frac{1}{2}$ broad, at first finely downy, glabrescent, 30–40-seeded.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Very near *C. striata*, except in the number of leaflets.

4. **LUPINUS**, Linn.; Benth. et Hook. f. Gen. Plant. i. 480.

Calyx deeply 2-lipped, upper lip entire or emarginate in our species, lower slightly 3-toothed. Standard ovate, wings large, oblong, including the small upcurved rostrate keel. Stamens united in a close tube. Ovary sessile, ∞-ovulate; style slender, upcurved, glabrous; stigma capitate ciliate. Legume compressed, silky, septate between the seeds, 2-valved.

A large genus, almost entirely American. A few annual species with digitate leaves inhabit the shores of the Mediterranean, of which one extends into Tropical Africa.

1. **L. Termis,** *Forsk.; DC. Prodr.* ii. 407. Stem 12–18 in. high, not much branched, erect, silky. Petioles $1\frac{1}{2}$–2 in. long, slender, erect. Leaves digitate, with 5–7 sessile oblanceolate leaflets about 1 in. long, 2–4 lines broad, the under side silky. Flowers in lax 4–12-flowered sessile racemes. Calyx silky, campanulate, 3–4 lines deep, teeth reaching halfway down. Corolla more than twice as long as the calyx; the standard blue round the border, white within, the wings white, the keel white with a dark blue spot. Pod 3 in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. thick, mucronate, thinly silky.—Guill. et Perr. Fl. Seneg. 224.

Upper Guinea. Senegambia, *Leprieur and Perrottet.*
Nile Land. Cultivated on the banks of the White Nile, in 15° N. lat., *Speke and Grant!* Nubia, *Ehrenberg.* Abyssinia, *Schimper!*
Very near *L. albus*, L., and perhaps not distinct from it.

5. **ARGYROLOBIUM**, Eck. et Zeyh.; Benth. et Hook. f. Gen. Plant. i. 480.

Calyx deeply bilabiate, two upper teeth free in all the Tropical African species, three lower ones more or less (in one species entirely) connate. Standard suborbicular, wings free, keel slightly upcurved, not rostrate. Filaments usually but not invariably united downwards in a closed tube. Ovary sessile, linear, ∞-ovulate; style upcurved, glabrous, stigma oblique. Pod linear, flattened, faintly torulose. —Undershrubs or herbs with digitately trifoliolate leaves.

A genus of moderate size, with its head-quarters at the Cape, outlying representatives reaching India, Siberia, and Central Europe.

A herbaceous annual . . . . . 1. *A. abyssinicum.*
More or less shrubby perennials.
  Lower lip of calyx entire . . . . . 2. *A. remotum.*
  Lower lip of calyx 3-cleft.
    Flowers many in a head.
      Pedicels very short; bracteoles setaceous . . . . . 3. *A. dorycnoides.*
      Pedicels 1½–4 lines long; bracteoles linear-lanceolate.
        Leaflets blunt, 9–12 lines long . . . . . 4. *A. Schimperianum.*
        Leaflets acute, 12–18 lines long . . . . . 5. *A. æquinoctiale.*
    Flowers 1–4 in lax heads.
      Flowers usually terminal on leafy branches . . . . 6. *A. ramosissimum.*
      Flowers all on naked lateral peduncles . . . . . 7. *A. virgatum.*
  Flowers solitary . . . . . 8. *A. Petitianum.*

1. **A. abyssinicum,** *Janb. et Spach, Illustr. Pl. Or.* i. 115. Annual, herbaceous, 6–18 in. high, copiously and diffusely branched, silky upwards. Stipules minute, setaceous, deciduous. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long, slender, silky. Leaflets linear or oblanceolate, central $\frac{1}{2}$–$\frac{3}{4}$ in. long, narrowed to both ends, the upper surface glabrous, the lower thinly silky. Flowers 1–3 in short-stalked axillary racemes. Bracts small, linear. Pedicels 1–2 lines, silky. Calyx $\frac{1}{4}$ in. deep, silky, the lower lip cleft one-third down, the two teeth of the upper one lanceolate-acuminate. Corolla pale yellow, equalling the calyx. Pod 1–1$\frac{1}{4}$ in. long, $\frac{1}{8}$ in. broad, mucronate, thinly clothed with adpressed silky grey-hairs, 6–9-seeded.—A. Rich. Fl. Abyss. i. 162. *A. modestum*, Hochst. in Schimp. Hb. Abyss. No. 1326. *Tephrosia modesta*, Steud. in Schimp. Pl. Abyss. No. 809.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!* Nubia and Sennaar, *Schweinfurth!*

2. **A. remotum,** *Hochst. in Schimp. Hb. Abyss.* No. 1324. A copiously branched shrub with stiff erecto-patent subglabrous twigs. Stipules minute, linear, persistent. Petioles $\frac{1}{8}$ in. long. Leaflets obovate, truncate mucronate or emarginate, 3–4 lines long, subcoriaceous, glabrous when mature, green on both sides. Flowers 2–4 terminal on stiff leafy branches. Pedicels a line long, with large ovate scariose bracteoles. Calyx 2 lines deep, thinly silky, the lower lip entire. Corolla not seen. Pod 12–15 lines long, 2 lines broad, densely clothed with fine spreading grey hairs.—A. Rich. Fl. Abyss. i. 162.

Nile Land. Abyssinia, *Schimper!*

3. **A. dorycnoides,** *Baker.* A diffuse shrub with slender woody branches densely clothed with tawny silky hairs. Stipules setaceous, persistent, equalling the petioles, scarcely over a line long. Leaflets 3, oblong or oblanceolate, pale green, acute, subcoriaceous, clothed especially beneath with silky hairs like those of the branches; central 5–6 lines long, 2$\frac{1}{2}$–3 lines broad. Flowers 3–12 in copious dense terminal heads. Bracteoles setaceous, persistent, exceeding the very short pedicels. Calyx 2$\frac{1}{2}$ lines deep, thinly silky, two upper teeth linear-lanceolate, reaching more than halfway down. Corolla yellow, half as long again as the calyx; standard 2 lines broad, thinly silky on

the back. Staminal tube closed. Pod (only seen immature) linear, densely silky, 8–9-seeded.

Nile Land. Abyssinia, *Schimper!*

General habit of *A. Schimperianum*, from which it may easily be known by its smaller subsessile flowers.

4. **A. Schimperianum,** *Hochst. in Schimp. Hb. Abyss.* 1326. A small shrub, with long woody branches, the young ones densely clothed with brown silky pubescence. Stipules small, linear, silky, persistent. Petioles $\frac{1}{2}$–1 in. long. Leaflets oblong-obovate, central $\frac{3}{4}$–1 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, apex rounded mucronate, the under surface thinly silky. Flowers in dense terminal heads of 3–8 flowers. Bracteoles linear, silky, equalling the silky pedicels, which are $1\frac{1}{2}$–2 lines long. Calyx $\frac{5}{8}$ in. deep, silky, lower lip cut halfway down into three linear teeth, two upper teeth shorter and lanceolate. Corolla yellow, half as long again as the calyx. Pod 12–15 lines long, $2\frac{1}{2}$ lines broad, densely clothed with brown silky hairs, 7–8-seeded.—A. Rich. Fl. Abyss. i. 163; *Cytisus Schimperianus*, Steud. in Schimp. Hb. Abyss. No. 990. *A. dasycarpum*, Hochst. in Schimp. Hb. Abyss. No. 1326.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.* Kordofan, *Cienkowsky.*

5. **A. æquinoctiale,** *Welw. mss.* An undershrub about a foot high with many erect slender dichotomously-forked branches densely clothed with spreading grey-brown silky hairs. Stipules ovate-lanceolate, 6–7 lines, persistent. Petioles 3–8 lines. Leaflets obovate-oblong, 12–18 lines long, acute, upper surface thinly, lower more densely clothed with grey and brown silky hairs. Flowers 6–12 in close heads on leaf-opposed peduncles 1–2 in. long. Pedicels densely-silky, 2–4 lines. Bracteoles linear-lanceolate, 2–3 lines. Calyx $\frac{3}{8}$ in. long, thinly silky, the two lips equal, with lanceolate teeth reaching halfway down. Corolla yellow, $\frac{1}{2}$ in. long, the standard 5–6 lines broad. Ovary linear, densely silky, multiovulate. Pod not seen.

Lower Guinea. Highlands of Huilla, Benguela, *Dr. Welwitsch!*

6. **A. ramosissimum,** *Baker.* A very densely branched low shrub with slender finely silky twigs. Stipules minute, setaceous, persistent. Petioles a line or less long. Leaflets oblong or oblanceolate, acute or bluntish, 2–4 lines long, finely silky principally beneath. Flowers 1–4, mostly terminal on leafy branches, rarely on short axillary peduncles. Pedicels a line long, with minute setaceous bracteoles. Calyx 2–$2\frac{1}{2}$ lines deep, bilabiate two-thirds of the way down, subglabrous, the teeth of the upper lip linear. Corolla bright yellow, nearly twice the calyx. Ovary linear, densely silky; ovules 6–8. Mature pod not seen.

Nile Land. Abyssinia, *Schimper!*

7. **A. virgatum,** *Baker.* A copiously branched shrub $1\frac{1}{2}$–2 feet high with very slender twigs which are finely silky when young only. Stipules 2–3 lines long, ovate-acuminate, persistent. Petiole 3–6 lines.

Leaflets oblong or oblanceolate, acute, 9–15 lines long, thinly silky principally beneath. Flowers 2–3 together on sparse naked leaf-opposed peduncles 12–18 lines long. Pedicels and silky linear bracts a line long. Calyx $2\frac{1}{2}$ lines deep, bilabiate two-thirds of the way down, with a few adpressed silky hairs, teeth of the upper lip linear. Corolla not seen. Pod linear, 12–14 lines long, 2 lines broad, with a few adpressed silky hairs, pointed, 7–8-seeded.

Nile Land. Abyssinia, *Schimper!*
Agrees with the Indian *A. flaccidum*, J. et S., in pod and general habit.

8. **A. Petitianum,** *A. Rich. Fl. Abyss.* i. 163. Shrub with branches clothed with white-silky pubescence. Petioles short. Stipules ovate-acuminate, silky, persistent. Leaflets very small obovate, apex rounded mucronate, glaucous, upper surface dotted and slightly silky, the lower more so. Flowers solitary, terminal or axillary. Bracts lanceolate. Lower lip of the calyx with three narrow teeth, teeth of the upper lip ovate-acuminate. Corolla yellow. Pod narrow, compressed, clothed like the rest of the plant with long white silky hairs.

Nile Land. Abyssinia, *Petit!*
This we have not seen.

6. **ADENOCARPUS.** DC.; Benth. et Hook. f. Gen. Plant. i. 481.

Calyx with the two upper teeth free, the lower ones more or less thoroughly connate. Petals shortly unguiculate; standard oblong or roundish; wings oblong; keel blunt in our species. Stamens united in a closed tube; anthers dimorphous. Ovary sessile, multiovulate; style upcurved glabrous; stigma capitate. Pod linear, compressed, densely viscous.—Silky shrubs with digitately trifoliolate leaves.

A small genus, principally Mediterranean.

Leaflets oblong, acute; lower lip of calyx trifid . . . . . 1. *A. Mannii.*
Leaflets oblanceolate; lower lip of calyx entire . . . . . 2. *A. benguellensis.*

1. **A. Mannii,** *Hook. f. in Journ. Linn. Soc.* vi. 8. A woody shrub 5–6 feet high, with rigid erecto-patent densely brown-silky branchlets. Leaves dense, often fascicled. Petioles under a line, densely silky. Leaflets oblong, acute, coriaceous, revolute when dry, 2–3 lines long. Flowers in dense sessile terminal heads. Calyx very silky, 4 lines deep, the two upper teeth lanceolate acuminate, equal to the tube, the lower lip longer, with three setaceous teeth at the apex. Corolla scarcely half as long again as the calyx, the standard 4 lines broad. Pod 9–10 lines long, $2\frac{1}{2}$ lines broad, 5–6-seeded.

Upper Guinea. Cameroon Mountains, at 8–1200 feet, *Mann!* who also gathered a variety with smaller leaflets and flowers on Clarence Peak, Fernando Po.

2. **A. benguellensis,** *Welw. mss.* A diffuse shrub 3 to 5 feet high, with long spreading finely grey-silky erecto-patent branches. Leaves not so dense as in the other species, but usually fascicled. Petioles $1\frac{1}{2}$–2 lines, finely grey-silky. Leaflets oblanceolate, 3–6 lines long,

bluntish with a faint mucro, not coriaceous, both sides finely grey-silky. Flowers 2–8 in close terminal heads. Calyx turbinate, finely silky, the two upper teeth lanceolate-deltoid, as long as the tube, the lower lip entire, lanceolate, longer. Pod 10–12 lines long, ¼ in. broad, 3–4-seeded.

Lower Guinea. Benguela, rocks of the Morro de Topollo, *Dr. Welwitsch!*

7. **ONONIS.** Linn.; Benth. et Hook. f. Gen. Plant. i. 485.

Calyx-tube short, lobes equal. Standard orbicular, with a short claw; wings obovate-oblong; keel incurved, rostrate. Stamens all connate in a closed tube, the alternate filaments all dilated upwards, anthers alternately shorter and versatile and longer and fastened near the base. Ovary more or less stalked, 2–∞-ovulate; style incurved or inflexed, glabrous; stigma oblique or capitate. Pod oblong and turgid in our species.—Herbs or undershrubs.

A large genus, with its head-quarters round the Mediterranean, of which a single species extends into our limits.

1. **O. Cherleri,** *Linn.; DC. Prod.* ii. 162. Stems herbaceous, slender, 4–8 in. long, copiously and diffusely branched, the whole plant viscous. Leaflets 3, obovate-cuneate, apex inciso-crenate, central one stalked. Stipules adnate, half-sagittate. Flowers copious, axillary, solitary. Calyx ¼–⅜ in. deep, teeth narrow-linear, reaching down nearly to the base. Corolla between pink and purple, like the oblong turgid pod about equalling the calyx.—A. Rich. Fl. Abyss. 161; Sibth. et Sm. Fl. Græc. t. 677; *O. parvula,* Steud. in Schimp. Hb. Abyss. 1102. *O. reclinata,* Schweinf.

Nile Land. Abyssinia, *Schimper!*

Very near *O. reclinata,* from which it differs principally by its smaller flowers and pods.

8. **PAROCHETUS.** Hamilt.; Benth. and Hook. f. Gen. Plant. i. 485.

Calyx-teeth subequal, two upper subconnate. Petals free from the staminal tube; standard obovate with a short claw; wings falcate oblong; keel shorter than the wings, abruptly inflexed, subacute. Stamens diadelphous, filaments not dilated, and anthers subuniform. Ovary sessile, ∝-ovulate; style inflexed upwards, glabrous; stigma small, terminal. Pod linear, finally subturgid, obliquely arcuate, two-valved. continuous within.

A single species.

1. **P. communis,** *Hamilt.; DC. Prod.* ii. 403. Rhizome slender, herbaceous, wide-creeping. Stipules ¼ in. long, ovate, membranous. Petioles 3–4 in. long, slender, erect, slightly hairy. Leaflets 3, subsessile, obcordate, uniform, ¾ in. long, usually rather broader, membranous, nearly glabrous. Peduncles 1-flowered, arising from the

rhizome, similar to and rather longer than the petioles. Calyx 3½ lines deep, glabrous, the teeth lanceolate, not reaching halfway down. Corolla pale purplish, three times as long as the calyx. Pod linear, ¾–1 in. long, under ¼ in. broad, acute, many-seeded. *P. major*, Don, l.c. Bennett, Pl. Jav. Rar. t. 34. Wight, Ic. t. 483.

Mozamb. Distr. Zambesi land, Manganya Hills, *Dr. Meller!*
Habit of *Oxalis Acetosella*. A native of the East Indies and Malay islands.

9. **TRIGONELLA.** Linn.; Benth. et Hook. f. Gen. Plant. i. 486.

Calyx tubular with five subequal teeth. Petals free from the staminal tube, caducous; standard obovate; wings oblong; keel obtuse, very short. Stamens diadelphous; filaments not dilated; anthers uniform. Pod linear or oblong, compressed, rostrate, often falcate, few or many-seeded.—Herbs, usually annual, with pinnately trifoliolate leaves.

A considerable genus, with its head-quarters in the temperate regions of the Old World.

Pod linear, decidedly falcate.
  Flowers sessile, 1–2 together . . . . . 1. *T. Fœnum-græcum.*
  Flowers in dense short-stalked racemes . . . . . 2. *T. hamosa.*
Pod oblong or linear, straight.
  Pod oblong, scarcely exceeding the calyx, usually 2-seeded.
    Flowers sessile, 2–4 together . . . . . 3. *T. occulta.*
    Flowers 6–12 in dense short-stalked racemes . . . . 4. *T. marginata.*
  Pod linear-oblong, 5–6 seeded . . . . . 5. *T. laciniata.*

1. **T. Fœnum-græcum,** *L.*; *DC. Prod.* ii. 182. An erect subglabrous annual 1–2 ft. high. Leaflets obovate-cuneate, 8–9 lines long. Flowers solitary or in pairs in the axils of the leaves. Calyx 3–4 lines long, teeth linear. Corolla bright yellow, under twice the calyx. Pod glabrous, linear-falcate, long-beaked, 2–4 in. long, 10–20-seeded.—A. Rich. Fl. Abyss. i. 165.

Nile Land. Abyssinia, probably only cultivated, *Schimper!* &c.; Nubia, *Kotschy!*
Once much cultivated as a forage plant, but now going out of use.

2. **T. hamosa,** *Linn.*; *DC. Prod.* ii. 183. Stems annual, herbaceous, 1 ft. or more long, diffusely branched, glabrous. Petioles ⅜–½ in. long. Leaflets obovate-cuneate, ½ in. long, truncate or emarginate, the upper half inciso-crenate, terminal one on a stalk 1–2 lines long. Flowers in copious short axillary racemes of 6–12 flowers each. Peduncles ½ in., ending in a weak spine at the apex. Pedicels under a line long. Calyx ½ line long, teeth very short. Corolla pale yellow, three or four times as long as the calyx. Pod linear-falcate, ¼–½ in. long, prominently reticulato-rugose, about 4-seeded.—Sibth. Fl. Græc. t. 764. Harv. Fl. Cap. ii. 162. *T. glabra*, Thunb. Fl. Cap. 610.

Nile Land. Banks of the White Nile, *Kotschy! Dr. Bromfield!*
Habit of *Melilotus*. Also a plant of Egypt, the Cape, and India.

3. **T. occulta,** *Delile*; *DC. Prod.* ii. 185. A very diffuse finely silky annual with stems under half a foot long. Stipules deeply laciniated

Mo. Bot. Garden,
1896.

from the apex. Leaves oblanceolate, deeply serrated, 1–3 lines long. Flowers 2–4 in sessile axillary clusters. Calyx $\frac{1}{8}$ in. deep, the linear-setaceous teeth shorter than the tube. Corolla yellow, half as long again as the calyx. Pod elliptical, scarcely exserted, glabrous, transversely reticulated with raised veins, usually 2-seeded.—*T. argutu*, Vis. Pl. Ægypt. 33, t. 8, fig. 1.

Nile Land. Sennaar and Kordofan, *Kotschy!* Nile--bank at Ipsambul, *Dr. Bromfield!*

Egypt to N. India.

4. **T. marginata,** *Hochst. et Steud. in Schimp. Hb. Abyss.* No. 64. Annual, copiously branched at the crown of the root, the branches spreading, 4–6 in. long, glabrous. Lower petioles over an inch. Leaflets obovate-cuneate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, toothed, glabrous. Flowers in copious capitate racemes of 6–12 each on peduncles $\frac{1}{4}$–$\frac{1}{2}$ in. long. Pedicels very short. Calyx $1\frac{1}{2}$–2 lines long, the subulate teeth twice as long as the tube. Pod oblong straight scarcely exceeding the calyx, glabrous, 2-seeded.

Nile Land. Abyssinia, *Schimper!*

General habit very like that of *T. ornithopodioides*, but the pod different.

5. **T. laciniata,** *Linn.; DC. Prod.* ii. 184. A diffuse glabrous annual with stems a foot or more long. Stipules laciniate from the apex. Leaflets obovate-cuneate, deeply serrated, 4–9 lines long. Flowers 6–12 in congested axillary racemes on peduncles 3–18 lines long. Calyx $\frac{1}{8}$ in. deep, teeth setaceous, equalling the tube. Corolla bright yellow, nearly twice the calyx. Pod linear-oblong, straight, glabrous, transversely reticulated with raised lines, 5–6-seeded.

Nile Land. Banks of the Nile near Dongola, *Dr. Bromfield!*

An Egyptian species.

10. **MEDICAGO,** Linn.; Benth. et Hook. f. Gen. Plant. i. 487.

Calyx-tube short, with 5 subequal teeth. Corolla caducous, petals free from the staminal tube; standard obovate, keel short obtuse. Stamens diadelphous, filaments not dilated, anthers uniform. Ovary sessile, usually multiovulate, style subulate, glabrous, stigma oblique. Pod usually many times spirally twisted, often muricated.—Herbs, often annual, with pinnately trifoliolate leaves.

A considerable genus, with its head-quarters round the Mediterranean, to the Flora of which all our species belong.

Biennial; pod reniform, one-seeded . . . . . 1. *M. lupulina.*
Annual; pod 3–4 times spirally twisted.
  Pod broader than deep, not muricated . . . . . 2. *M. orbicularis.*
  Pod globose, muricated.
    Spines hiding the finely-veined faces.
      Stipules subentire . . . . . 3. *M. minima.*
      Stipules laciniated . . . . . 4. *M. laciniata.*
    Spines not hiding the reticulated faces . . . . . 5. *M. denticulata.*
  Pod barrel-shaped, muricated . . . . . 6. *M. tentaculata.*

1. **M. lupulina,** *Linn.; DC. Prod.* ii. 172. Stems biennial herbaceous, 1 ft. or more long, procumbent, copiously branched, slightly downy. Stipules $\frac{1}{4}$–$\frac{3}{8}$ in. long, toothed, the free part lanceolate acuminate. Leaflets obovate, toothed. Flowers in long-stalked rounded heads. Pedicels short. Calyx subtubular, with lanceolate teeth. Corolla bright yellow, twice the calyx. Pod 1-seeded, reniform, with an incurved point, reticulate, ultimately black.—E. B. t. 971.

Nile Land. Abyssinia, *Schimper!*
All through Europe to Siberia and India; introduced in N. America.

2. **M. orbicularis,** *All.; DC. Prod.* ii. 174. Stems annual, subglabrous, 1 ft. or more long, diffuse. Stipules short, laciniated. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaflets obovate-cuneate, toothed, $\frac{3}{8}$–$\frac{1}{2}$ in. long. Peduncles $\frac{1}{2}$–1 in. long, 2–3-flowered. Calyx $\frac{1}{8}$ in. long, teeth linear. Pods $\frac{1}{2}$–$\frac{3}{4}$ in. broad, of 3–5 spirals which grow gradually smaller upwards, entirely spineless, the faces glabrous, prominently reticulato-rugose.—A. Rich. Fl. Abyss. i. 164.

Nile Land. Abyssinia, *Schimper and Quartin-Dillon.*
A Mediterranean species, reaching the Canaries, Syria, and Scinde.

3. **M. minima,** *Lam.; DC. Prod.* ii. 178. Stem annual, 6 in. long, diffuse, downy. Stipules with lanceolate free points, outer edge entire or slightly toothed. Petioles under $\frac{1}{2}$ in. long. Leaflets obovate-cuneate, finely toothed. Flowers in short-stalked clusters of 2–4. Calyx one line long, thinly hairy, teeth linear, reaching more than halfway down. Corolla yellow, half as long again as the calyx. Pod globose, with 3–5 spirals, $\frac{1}{8}$ in. broad without the spines, the faces hidden and finely-veined.—E.B.S. t. 2635. *M. græca,* Horn. Hort. Hafn. 24. A. Rich. Fl. Abyss. i. 165.

Nile Land. Abyssinia, *Schimper!*
A common European and West Asian species.

4. **M. laciniata,** *All.; DC. Prod.* ii. 180. Annual, very diffuse, the whole plant glabrous. Stipules laciniate. Leaflets obovate-cuneate, 2–4 lines long, sharply toothed. Flowers 1–2 on short peduncles. Calyx $\frac{1}{8}$ in. deep, teeth lanceolate acuminate. Corolla bright yellow, half as long again as the calyx. Pod globose, 2 lines broad exclusive of the spines, with 4–5 densely muricated spirals, the finely veined faces quite hidden.

Nile Land. Abyssinia, *Schweinfurth.*
All round the Mediterranean, and also one of the few Cape species.

5. **M. denticulata,** *Willd.; DC. Prod.* ii. 176. Stem annual, 6–12 in. long, diffuse, subglabrous. Stipules laciniated, the free points linear. Leaflets obovate-cuneate, toothed. Peduncles an inch long, the flowers in heads of 3–6. Pedicels shorter than the calyx, which is a line long, teeth lanceolate-subulate. Corolla yellow, half as long again as the calyx. Pod glabrous, globose, $\frac{1}{4}$ in. broad without the spines, with 2–4 spirals, the faces reticulated with raised veins, the spines

straight, about ½ line long.—E.B.S. t. 2634. A. Rich. Fl. Abyss. i. 165. *M. apiculata*, Willd. l.c.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*
All the specimens we have seen in fruit belong to the *var. apiculata*. The species is now widely dispersed as a weed, having reached Japan, the United States, Chili, India, and New Zealand.

6. **M. tentaculata,** *Willd.; DC. Prod.* ii. 177. A diffuse glabrous annual with stems 12–18 in. long. Stipules deeply toothed along the outer edge. Leaflets obovate-cuneate, 3–6 lines long. Flowers 2–3 together, on a peduncle under 1 in. long. Calyx ⅛ in. deep, finely silky, the teeth linear. Corolla yellow, half as long again as the calyx. Pod barrel-shaped, with 4–5 spirals, each with a distinct acute keel and a row of short strong spreading spines on each side.—*M. truncatulata*, Gærtn. Fruct. ii. 150.

Nile Land. Abyssinia, *teste Schweinfurth.*
A rare Mediterranean species.

11. **MELILOTUS,** Juss.; Benth. et Hook. f. Gen. Plant. i. 487.

Calyx with a campanulate tube and 5 subequal teeth. Corolla caducous, not adhering to the staminal tube; standard obovate-oblong; wings oblong; keel blunt, often shorter than the wings. Stamens diadelphous; filaments not dilated; anthers uniform. Ovary sessile or stipitate. Pod subglobose or ovoid, subindehiscent, 1–2-seeded.—Annuals or biennials with pinnately trifoliolate leaves with toothed leaflets and flowers in stalked racemes.

A moderately small genus, with its head-quarters in Europe.

Pods a line long, irregularly reticulato-rugose.
Corolla twice as long as the subsessile calyx . . . . . 1. *M. parviflora.*
Corolla three times as long as the distinctly-stalked calyx . . . 2. *M. gracilis.*
Pods 2 lines long, marked with regular arched bars . . . . . 3. *M. abyssinica.*

1. **M. parviflora,** *Desf.; DC. Prod.* ii. 187. An erect much-branched slender glabrous annual 1–2 ft. high. Petioles 12–18 lines. Leaflets obovate-cuneate, 6–9 lines long, finely toothed. Flowers 12–30 in lax short-stalked axillary racemes. Pedicel scarcely any. Calyx ½ line deep, the teeth shorter than the tube. Corolla pale yellow, twice the calyx, the standard exceeding the other petals a little. Pod a line long, globose, glabrous, obscurely reticulate-rugose, 1-seeded.—A. Rich. Fl. Abyss. i. 166.

Nile Land. Abyssinia, *Quartin-Dillon and Petit!*
Originally a Mediterranean species, now spread over almost the whole world as a weed.

2. **M. gracilis,** *DC. Prod.* ii. 188. An erect much-branched slender glabrous annual a foot or more high. Petioles 3–5 lines. Leaflets oblanceolate or obovate, 6–8 lines long, the upper half toothed. Flowers 6–12 in lax axillary racemes on peduncles 12–18 lines long. Pedicel nearly as long as the calyx. Calyx half a line deep, teeth lanceolate

acuminate equalling the tube. Corolla pale yellow, three times as long as the calyx, all the petals equal. Pod a line long, globose, glabrous, distinctly reticulato-rugose, 1-seeded. — *M. neapolitana*, Ten. Prod. Suppl. i. 56.

Nile Land. Abyssinia (*teste Schweinfurth*).
A common Mediterranean species.

3. **M. abyssinica,** *Baker.* Stems 1–2 ft. high, erect, glabrous, copiously branched. Petioles ¾–1 in. long; leaflets obovate-cuneate, toothed, 9–15 lines long. Flowers in copious stalked lax axillary racemes 1–2 in. long. Pedicels cernuous, equalling the calyx, which is scarcely a line long, teeth lanceolate, reaching halfway down. Corolla pale yellow, quite twice as long as the calyx, the wings and keel rather shorter than the standard. Pod sessile, glabrous, roundish with a mucro, 2 lines each way, the keel thick and prominent with a channel on each side, faces marked with parallel raised transverse bars, which are a little connected by intermediate ones, the seeds two.—*M. italica*, A. Rich. Fl. Abyss. i. 166, non Lam.; DC. ii. 188.

Nile Land. Abyssinia, *Schimper! Parkyns!*
Pod with a keel like that of *M. italica*, but the bars regularly arcuate, the seeds two instead of one, and flowers much smaller.

12. **TRIFOLIUM,** Linn.; Benth. et Hook. f. Gen. Plant. i. 487.

Calyx-teeth subequal, two upper sometimes more or less connate. Petals adnate below to the staminal tube; standard ovate or oblong; wings narrow; keel shorter obtuse. Stamens diadelphous; alternate filaments or all of them more or less dilated; anthers uniform. Ovary sessile or stalked, 1- or -pauci-ovulate, rarely multiovulate; style filiform; stigma capitate or oblique. Pod oblong, rarely linear-oblong; seeds 1–2, rarely more.—Herbs with the leaflets three in all our species, toothed in all but one, sessile or faintly stalked.

A large genus extending all round the North Temperate zone, stretching southward to the South Temperate zone along the mountains; with us almost exclusively Nilotic.

§ **Lagopus.**—Calyx with an elevated hairy ring at the throat . 1. *T. arvense.*

Calyx without a ring of hairs at the throat.
Bracts forming a distinct conspicuous whorl round the heads of flowers.

§§ **Vesicastrum.** —Fruit-calyx accrescent, arching, membranous.

Perennial, with procumbent stems . . . . . 2. *T. fragiferum.*
Annual, with erect stems . . . . . 3. *T. Steudneri.*

§§§ **Eutriphyllum.**—Fruit-calyx not accrescent.

Flowers 6–12 in dense heads on long erect stems.
Calyx distinctly stalked . . . . . 4. *T. umbellulatum.*
Calyx subsessile . . . . . 5. *T. Quartinianum.*
Flowers 2–3; stems very short . . . . . 6. *T. acaule.*
Bracts indistinct or obsolete.

§§§§ **Lupinaster** (*Loxospermum*, Hochst.).—Annuals, with large flowers, 1–4 together, and numerous seeds.

Leaflets entire . . . . . 7. *T. Schimperi.*
Leaflets toothed.
Calyx 10-nerved . . . . . 8. *T. calocephalum.*
Calyx 15–20-nerved . . . . . 9. *T. multinerve.*

§§§§§ **Repentes.**—Perennials, with a woody rootstock and procumbent stems.

Leaves distinctly stalked.
Teeth of calyx equal to the tube . . . . . 10. *T. semipilosum.*
Teeth of calyx shorter than the tube . . . . . 11. *T. Petitianum.*
Leaves subsessile . . . . . 12. *T. cryptopodium.*

§§§§§§ **Capitatæ.**—Annuals or perennials, with flowers in dense round or oblong heads.

Standard accrescent, becoming flat and membranous . . . 13. *T. procumbens.*
Standard shrivelling, not accrescent.
Leaves subsessile; stipules vaginant.
Stipules an inch long; heads round . . . . . 14. *T. simense.*
Stipules half an inch long; heads oblong . . . . . 15. *T. polystachyum.*
Leaves stalked; stems hairy.
Leaves glabrous. . . . . 16. *T. Ruppellianum*
Leaves pubescent.
Leaflets oblong; stems erect . . . . . 17. *T. bilineatum.*
Leaflets oblanceolate; stems trailing . . . . . 18. *T. africanum.*
Leaves stalked; stems glabrous.
Stipules adnate for the lower third or quarter only . . 19. *T. alexandrinum*
Stipules adnate for the lower half.
Calyx-teeth linear-setaceous . . . . . 20. *T. subrotundum.*
Calyx-teeth lanceolate . . . . . 21. *T. tembense.*

1. **T. arvense,** *Linn.*; *DC. Prod.* ii. 190. Stems annual, erect, 6–12 in., copiously branched. Stipules $\frac{1}{4}$–$\frac{1}{2}$ in. long, the free points lanceolate. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaflets linear-obovate, about $\frac{1}{2}$ in. long, by $\frac{1}{36}$ in. broad. Flowers in dense stalked oblong heads. Calyx tubular, $\frac{1}{4}$ in. long, faintly 10-nerved, densely silky, teeth twice as long as the tube, subulate, densely ciliated with long silky hairs. Corolla reddish, considerably shorter than the calyx. Pod sessile, 1-seeded.—A. Rich. Fl. Abyss. i. 166.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit.*
Agrees with the ordinary form of the European plant.

2. **T. fragiferum,** *Linn.*; *DC. Prod.* ii. 202. Perennial with cæspitose procumbent rooting stems. Stipules semi-adnate with lanceolate points. Leaflets oblong-obovate, sessile. Heads dense, 3–4 lines broad, with bracts which equal the subsessile calyx. Calyx $1\frac{1}{2}$–2 lines long, with linear teeth, becoming much dilated and membranous. Corolla pale rose, twice the calyx. Pod included, ovoid, 1–2-seeded.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*
Through Europe to Afghanistan.

3. **T. Steudneri,** *Schweinf. in Verh. Zool.-Bot. Gesell. Wien.* xviii. 652. Annual, glabrous. Stems erect, branched. Stipules with lanceolate points. Petioles an inch or more long. Leaflets linear, shortly stalked,

an inch long, glabrous. Peduncles exceeding leaves. Flowers about 20 in a dense head; bracts equalling the calyx. Calyx sessile, $2\frac{1}{2}$ lines long, becoming dilated and inflated as in *T. fragiferum*, the deltoid acuminate teeth half as long as the tube. Corolla violet, twice as long as the calyx. Pod ovoid, 2-seeded.

Nile Land. Abyssinia, Ataba, *Steudner*.

4. **T. umbellulatum,** *A. Rich. Fl. Abyss.* i. 172. Stem a foot high, erect, glabrous, branched from the base. Stipules membranous, lower part sheathing the stem, the free points ovate-acuminate. Leaflets elliptical, obtuse, rarely subovate, sharply toothed. Flowers in heads of 3–10, surrounded by a whorl of short blunt bracts. Calyx short-stalked, tube 10-nerved, teeth lanceolate, rather longer than the tube. Corolla bluish, slightly exceeding the calyx. Pod compressed, elliptic-oblong, twice as long as tube, apiculate, 5-seeded.

Nile Land. Abyssinia, *Quartin-Dillon and Petit*.
This we have not seen. The author compares it with and considers it near *T. subrotundum*.

5. **T. Quartinianum,** *A. Rich. Fl. Abyss.* i. 169. Stem a foot high, suberect, glabrous. Stipules 1 in. long, adnate to the petiole for the lower three-quarters, the point lanceolate. Petioles 1–2 in. long, glabrous. Leaflets subsessile, narrow-oblong, glabrous, $1\frac{1}{2}$–2 in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, finely toothed, blunt. Flowers in a few long-stalked dense rounded heads, surrounded by a whorl of imbricated ovate scariose strongly veined bracts $\frac{1}{8}$ in. broad. Calyx subsessile, 4 lines deep, finely striated, teeth lanceolate acuminate, reaching halfway down. Corolla purple, half as long again as the calyx. Pod oblong, pointed, about equalling the calyx, 1–2-seeded.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon!*
In general habit and the heads of flowers resembling *T. pratense* and *medium*.

6. **T. acaule,** *Steud. in Schimp. Pl. Abyss.* No. 587. Root thick, woody, a foot long. Stems very short, densely cæspitose. Stipules glabrous, adnate at the base only, the free points setaceous. Petioles at most only equalling the sessile oblanceolate leaflets, which are glabrous, rigid, strongly veined, finely toothed, $\frac{1}{4}$ in. long by half a line broad. Flowers in short-stalked clusters of 2–3 together, sometimes solitary, clusters surrounded by lanceolate-subulate bracts, which are considerably shorter than the pedicels, which are $\frac{1}{8}$ in. long. Calyx $\frac{1}{4}$ in. long, glabrous, with a few prominent nerves, the teeth lanceolate, reaching one-third of the way down. Corolla nearly twice the calyx.

Nile Land. Abyssinia, *Schimper!*
A very well-marked species.

7. **T. Schimperi,** *A. Rich. Fl. Abyss.* i. 173. Stems 6–12 in. long, annual erect or spreading, copiously branched. Stipules scariose, an inch long, the lower third sheathing the stem loosely, the point linear-setaceous. Petioles 1–$1\frac{1}{2}$ in. long. Leaflets sessile, linear, 1–$1\frac{1}{2}$ in.

long, 1 line or less broad, glabrous, entire, narrowed to both ends. Peduncles an inch long. Flowers 1–3 together on very short pedicels. Calyx $\frac{3}{4}$ in. long, glabrous, with 15 prominent striations, cut three-quarters of the way down, teeth linear-acuminate. Corolla rose-purple, equalling the calyx. Pod oblong, acuminate, slightly exceeding the calyx, 8–10-seeded. — *Trigonella Schimperi*, Hochst. et Steud. in Schimp. Hb. Abyss. 86. *Loxospermum Schimperi*, Hochst. in Schimp. Hb. Abyss. 1988.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Plowden!*
Recedes from the rest of the genus by its entire leaflets.

8. **T. calocephalum,** *Fresen. in Mus. Senck.* ii. 50. Stems annual, densely cæspitose, glabrous, diffuse, 6–12 in. long. Stipules $\frac{1}{2}$ in. long, broad, scariose, loosely sheathing, the free points lanceolate. Petioles 1–1$\frac{1}{2}$ in. long, slender, glabrous. Leaflets sessile, obovate-cuneate, $\frac{1}{2}$–$\frac{3}{4}$ in. long by half as broad, glabrous, finely toothed, the apex deeply emarginate. Peduncles 2–6 in. long, glabrous. Flowers in heads of 3–6 each. Pedicels short. Calyx $\frac{3}{8}$ in. deep, glabrous, faintly 10-nerved, teeth lanceolate cuspidate, reaching halfway down. Corolla $\frac{3}{4}$ in. long, purple, showy. Ovary multiovulate. Pod not known.—A. Rich. Fl. Abyss. i. 175. *Loxospermum calocephalum*, Hochst. in Flora, 1846, 595.

Nile Land. Abyssinia, *Schimper! Roth!*

9. **T. multinerve,** *A. Rich. Fl. Abyss.* i. 175. Stem annual, 6–12 in. long, glabrous, dichotomously and diffusely branched. Stipules $\frac{1}{4}$–$\frac{3}{8}$ in. long, adnate about halfway, the free point subulate. Petioles 1–1$\frac{1}{2}$ in. Leaflets sessile, oblanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{8}$ in. broad, pointed, upper half sharply toothed. Flowers 2–6 together, peduncles $\frac{1}{2}$ in. long, pedicels very short. Calyx cylindrical, $\frac{1}{4}$ in. long, with 15–20 fine prominent nerves, teeth linear-subulate, reaching a third of the way down, finely ciliated. Corolla large, showy, purple. Pod equalling the calyx, oblong, pointed, 7–8-seeded.—*Trigonella multinervis*, Hochst. et Steud. in Schimp. Hb. Abyss. i. 175. *Loxospermum multinerve*, Hochst. in Flora 1846, 595. β. *debilior*, A. Rich ; stem slender erect, 4–6 high, scarcely branched. Flowers 1–3 together, flowers and leaves smaller. A. Rich. loc. cit.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*
This and the two preceding form a group very well marked both by habit and by their many-seeded pods, on account of which they were referred by Hochstetter to *Trigonella*.

10. **T. semipilosum,** *Fresen. in Mus. Senck.* ii. 52. Rootstock woody. Stems densely cæspitose, slender, wide-creeping, finely silky. Stipules $\frac{3}{8}$ in. long, the lower two-thirds adnate, the free points lanceolate. Petioles $\frac{1}{2}$–1 in., glabrous or finely silky. Leaflets rotundato-obovate, sessile, 3–4 lines long, three-quarters as broad, strongly veined, glabrous or finely silky, faintly toothed, apex rounded. Flowers in long-stalked rounded heads of 6–12 each. Pedicels very short. Calyx $\frac{1}{4}$ in. long, 10-nerved, thinly silky, the teeth lanceolate, reaching

halfway down. Corolla pale, twice as long as the calyx, Pod about equalling the calyx, oblong, silky, 1–3-seeded.—A. Rich. Fl. Abyss. i. 167.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit! Roth!*
Very near the European *T. cæspitosum* and Cape *T. Burchellianum*, with which it coincides in general habit and appearance.

11. **T. Petitianum,** *A. Rich. Fl. Abyss.* i. 168. Rootstock woody. Stems densely cæspitose, glabrous, wide-creeping. Stipules $\frac{1}{4}$ in. long, adnate halfway down, the free point linear. Petioles $\frac{1}{2}$–1 in. long, slender, glabrous. Leaflets sessile, obovate-cuneate, glabrous, $\frac{1}{8}$–$\frac{1}{4}$ in. deep, nearly as broad, faintly toothed, the apex deeply emarginate with a rounded hollow. Flowers in long-stalked rounded heads of 4–6 each. Pedicels a line long. Calyx 2 lines long, 10-nerved, glabrous, teeth lanceolate, not reaching more than one-third the way down. Corolla pale, quite twice as long as the calyx. Ovules 2–3. Pod not seen.

Nile Land. Abyssinia, *Schimper! Petit!*
May be a variety of the preceding.

12. **T. cryptopodium,** *Steud. in Schimp. Hb. Abyss.* No. 556. Rootstock woody. Stems densely cæspitose, slender, procumbent, thinly silky upwards. Stipules $\frac{1}{8}$ in. long, membranous, the lower two-thirds sheathing the stem, the free points lanceolate-acuminate. Leaves nearly sessile, with three sessile obovate-cuneate leaflets, central $\frac{1}{8}$ in. long by nearly as broad, rigid, strongly nerved, toothed and slightly ciliated, apex truncate or emarginate. Flowers in long-stalked close heads of 8–12 each. Peduncles an inch long, thinly silky. Calyx sessile, 2 lines long, slightly silky, teeth lanceolate, reaching about halfway down. Corolla purplish, more than twice as long as the calyx. —A. Rich. Tent. Fl. Abyss. i. 168.

Nile Land. Abyssinia, *Schimper!*
Well marked in the group by its sessile leaves and sheathing stipules.

13. **T. procumbens,** *Linn.; DC. Prod.* ii. 205. Stem 6–12 in. high, annual. Stipules half adnate, the point deltoid-acuminate. Petioles equalling the obovate-cuneate leaflets, which are $\frac{3}{8}$–$\frac{1}{2}$ in. long, the central one stalked. Flowers in dense round stalked heads of 20–40. Calyx pedicellate, $\frac{1}{2}$ line long, three lower teeth lanceolate, reaching halfway down, two upper ones much broader and shorter. Corolla 2 lines long, bright yellow, the standard finally becoming 2 lines broad, flat, spoon-shaped, strongly veined, folded over the stalked, exserted, 1-seeded pod.—A. Rich. Fl. Abyss. i. 176.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*
Coincides with the ordinary form of the European plant.

14. **T. simense,** *Fresen. in Flora* 1839, 49. Stem herbaceous, 6–12 in. long, dichotomously branched from the base, slightly pubescent upwards. Stipules an inch long, forming a tight sheath round

the stem, reaching up quite to the base of the leaf, the free points lanceolate-setaceous. Leaflets sessile, 1–1½ in. long, 1 line broad, narrowed to both ends, firm and subrigid, teeth sharp. Flowers in dense rounded stalked heads ½–⅝ in. broad. Peduncles 1–2 in. long, downy. Calyx nearly sessile, ⅛ in. long, glabrous, teeth linear-subulate, reaching halfway down. Corolla purplish, nearly twice as long as the calyx.—A. Rich. Fl. Abyss. i. 171.

Upper Guinea. Fernando Po, 8000 ft., *Mann!* Cameroon Mountains, 7000 ft., *Mann!* Old Calabar, *Kewan!*
Nile Land. Abyssinia, *Schimper!* and others.

15. **T. polystachyum,** *Fresen. in Mus. Senck.* ii. 50. Stem 1–2 ft. long, copiously and diffusely branched, glabrous. Stipules ½ in. long, reaching up to the base of the leaves and sheathing, the free points linear. Leaflets subsessile, oblanceolate, ½–¾ in. long, ¼–⅜ in. broad, finely sharply toothed, apex rounded or slightly pointed. Flowers in stalked oblong heads finally 6–12 lines long. Peduncles 1–2 in. long, glabrous or slightly pilose. Pedicels very short. Calyx 2–2½ lines deep, 10-nerved, slightly hairy, the teeth linear-subulate, reaching halfway down, the two upper ones shorter than the rest. Corolla purplish, about a third as long again as the calyx. Pod oblong-acuminate, 1–2-seeded, equalling the tube.—A. Rich. Fl. Abyss. i. 167.

Nile Land. Abyssinia, *Schimper!* and others.
Lower Guinea. Angola; Huilla (a variety with a slightly longer calyx and more setaceous teeth), *Dr. Welwitsch!*
Mozamb. Distr. Lat. 6°·38, S., alt. 4700 ft., *Speke and Grant!*

16. **T. Ruppellianum,** *Fresen. in Mus. Senck.* ii. 51. Stem erect, branched, slightly pilose. Stipules broad, veined, the free points lanceolate, acuminate or cuspidate. Petioles 1–1½ in. long, leaflets obovate-cuneate, apiculate, toothed, glabrous. Flowers in rounded stalked heads, peduncles slightly pilose, longer than the leaves. Calyx 10-nerved, glabrous, the teeth subulate, equal, slightly hairy below, at first a little hooked, longer than the tube, shorter than the corolla.—A. Rich. Fl. Abyss. i. 170.

Nile Land. Abyssinia, *Ruppell.*

17. **T. bilineatum,** *Fresen. in Mus. Senck.* ii. 52. Annual, stem herbaceous, erect or suberect, 1 ft. or more long, densely clothed with spreading or deflexed pale silky hairs. Stipules ½ in. long, half adnate, the free points lanceolate. Petioles 1 in. or more, leaflets subsessile, nearly glabrous, oblong-cuneate, about ¾ in. long by half as broad, the teeth and veins towards the edge very distinct. Flowers in dense rounded heads ⅝ in. broad. Peduncles 1 in. or more long, pilose like the stem. Calyx subsessile, ¼ in. long, silky, faintly 10-nerved, the teeth linear-subulate, reaching halfway down, the lowest longer than the rest. Corolla reddish, slightly exceeding the calyx. Pod ovoid, 1-seeded.—A. Rich. Fl. Abyss. i. 170.

Nile Land. Abyssinia, *Ruppell. Schimper! Plowden!*

18. **T. africanum,** *Ser. in DC. Prod.* ii. 200. Stems herbaceous, 6 in. or more long, branched from the base, procumbent, clothed with dense spreading brown silky pubescence. Stipules ½ in. long, half-adnate, the free points linear or lanceolate. Upper leaves nearly sessile, lower on petioles 1–2 in. long. Leaflets sessile, oblanceolate, about ½ in. long by a third as broad, distinctly toothed, slightly pilose. Flowers in dense rounded heads half an inch broad. Peduncles 1½–3 in. long, densely pilose. Calyx sessile, under ¼ in. long, silky, teeth linear, reaching halfway down. Corolla purplish, slightly exceeding the calyx.—Harv. Fl. Cap. ii. 159. *T. hirsutum*, E. Meyer non Thunb.

Nile Land. Abyssinia, *Roth!*
A Cape species.

19. **T. alexandrinum,** *Linn.; DC. Prod.* ii. 193. Stems glabrous, 1–2 ft. high. Stipules an inch or more long, adnate only in the lower third or quarter. Leaflets oblong or oblong-lanceolate, quite glabrous, 1–2 in. long. Flowers 20–30 in dense long-stalked finally oblong heads. Bracts setaceous, very minute. Calyx sessile, ¼ in. long, finely-silky, the setaceous teeth exceeding the tube. Corolla yellowish, twice the calyx. Pod minute, included in the calyx-tube, 1-seeded.

Nile Land. Nubia, *Schweinfurth.*
The species commonly grown for forage in Egypt, under the name "Bersin."

20. **T. subrotundum,** *Steud. et Hochst. in Schimp. Hb. Abyss.* No. 103. Perennial stems herbaceous, 6–12 in. long, dichotomously and diffusely branched, glabrous. Stipules 3–4 lines long, half-adnate, the free points lanceolate acuminate. Upper leaves nearly sessile, lower on petioles sometimes 2–3 in. long. Leaflets sessile, obovate-cuneate, ½–¾ in. long, three-quarters as broad, glabrous, distinctly toothed. Flowers in copious dense rounded heads half an inch broad. Peduncles 1–3 in. long. Pedicels ½–1 line long, subtended by minute setaceous bracts. Calyx ¼ in. long, distinctly 10-nerved, the teeth linear-setaceous, reaching halfway down. Corolla half as long again as the calyx, white or purplish. Pod oblong apiculate, 2-seeded, equalling the calyx.—A. Rich. Fl. Abyss. i. 172. *Trigonella marginata*, Hochst. et Steud. in Schimp. Hb. Abyss. No. 64.

Upper Guinea. Clarence Peak, Fernando Po, 9000 ft., *Mann!*
A form with stipules ¼ in. broad.
Nile Land. Abyssinia, *Schimper!* and others.
Cultivated as forage, under the name of "Mayad."
Lower Guinea. Huilla (a form with remarkably obcordate leaflets), *Dr. Welwitsch!*

21. **T. tembense,** *Fresen. in Mus. Senck.* ii. 51. Stems herbaceous, glabrous, a foot or more long, spreading, striated, copiously branched. Stipules ½–⅝ in. long, ¾-adnate, membranous, conspicuously veined, the free points ovate cuspidate. Petioles 1–2 in. long, glabrous. Leaflets sessile, obovate-cuneate, ¾ in. long by half as broad, distinctly toothed, glabrous. Flowers in copious stalked rounded heads of 6–10 flowers each. Peduncles 1–2 in. long, glabrous. Pedicels a line long,

Calyx $\frac{1}{4}$ in. long, 10-nerved, glabrous, the teeth lanceolate-acuminate or cuspidate, equalling the tube. Corolla half as long again as the calyx, purplish, the standard showy, 2 lines broad. Pod sessile, included, oblong, pointed, 2–3-seeded.—A. Rich. Fl. Abyss. i. 170.

Nile Land. Abyssinia, *Schimper!* and others.

By its fewer flowers in a head and large showy corolla, this species connects the group with the *Lupinasters*, but the pod is different.

13. **ANTHYLLIS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 488.

Calyx tubular, in our species inflated in fruit, almost 2-lipped, the two upper teeth standing out before the others and subconnate. Petals with a long claw, the lower ones adnate by their claws to the staminal tube; standard ovate, auricled at the base; wings ovate, obtuse; keel shorter than the wings. Stamens all connate in a closed tube; alternate filaments or all dilated; anthers uniform. Ovary stalked, 1–2-ovulate; style upcurved, glabrous; stigma terminal, capitate. Pod ovoid, mucronate, in our plant continuous within, 1–2-seeded.—Stems herbaceous or suffruticose.

A small genus, extending through Europe and round the Mediterranean.

1. **A. Vulneraria,** *Linn.; DC. Prod.* ii. 170. Rootstock woody. Stems herbaceous, a foot or more long. Leaves pinnate, with 2–4 sessile linear-oblong leaflets on each side, the terminal one often much dilated and solitary in the root-leaves. Flowers in dense terminal heads, often two close together, surrounded by an involucre of deeply cut bifid or trifid bracts, which equal the densely silky calyx, which is sessile, $\frac{3}{8}$ in. long, becoming dilated, veined and scariose as the fruit matures, upper lip triangular, slightly emarginate, three teeth of the lower one lanceolate, $\frac{1}{2}$ line long. Corolla red, slightly exceeding the calyx. Pod $\frac{1}{8}$ in. long, short-stalked, glabrous.—A. Rich. Fl. Abyss. i. 164.

Nile Land. Abyssinia, *Schimper! Petit!*

Extends from Iceland eastward to Asia Minor.

14. **HELMINTHOCARPUM,** A. Rich.; Benth. et Hook. f. Gen. Plant. i. 489.

Calyx with the two upper teeth broader than the rest. Petals unguiculate, free from the staminal tube; standard suborbicular; wings obovate-oblong, slightly adhering to the keel, which is obtuse and a little upcurved. Stamens all connate or the upper one finally nearly free; alternate filaments dilated upwards; anthers uniform. Ovary sessile, 2-ovulate; style inflexed; stigma terminal. Pod linear, subtetragonous, circinate, coriaceous, indehiscent, transversely veined, with an imperfect dissepiment between the seeds.

A single species, known only in Abyssinia.

1. **H. abyssinicum,** *A. Rich. Fl. Abyss.* i. 200, t. 86. Stems herbaceous, wiry, slender, copiously branched from the base, 6–12 in. long,

diffuse, thinly clothed with close silky pubescence. Leaves subsessile, pinnate, with a terminal leaflet and three on each side, all subsessile, oblanceolate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, 1–1$\frac{1}{2}$ line broad, entire, mucronate, finely silky. Flowers in short-stalked heads from the axils of most of the leaves, 4–6 together. Pedicels shorter than the calyx, which is tubular, silky, 1 line long, the teeth deltoid. Corolla between yellow and red, twice as long as the calyx. Pod 2 lines across, the point nearly or quite brought round to the base.—*Antopetitia cancellata*, Hochst. in Schimp. Hb. Abyss. No. 1108.

Nile Land. Abyssinia, *Schimper! Roth!*

15. **LOTUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 490.

Calyx with a campanulate tube and five subequal teeth. Corolla caducous, free from the staminal tube; standard unguiculate, wings obovate; keel upcurved rostrate. Stamens diadelphous; alternate filaments dilated; anthers nearly uniform. Ovary sessile ∞-ovulate; style upcurved; stigma terminal or lateral. Pod linear, straight in our species, turgid, 2-valved, septate between the seeds.—Herbs with usually five leaflets, the lowest pair like stipules.

A large genus, belonging to the North and South Temperate zones of both hemispheres.

Bracts simple.
- Calyx-teeth shorter than the tube . . . . . 1. *L. tigrensis.*
- Calyx-teeth exceeding the tube.
  - Pod not much longer than the calyx, 4–6-seeded.
    - Stem and leaves silky . . . . . 2. *L. nubicus.*
    - Stem and leaves subglabrous . . . . . 3. *L. brachycarpus.*
  - Pod 4–6 times the length of the calyx, 10–12-seeded.
    - Flowers usually 2–4 together . . . . . 4. *L. arabicus.*
    - Flowers usually solitary . . . . . 5. *L. mossamedensis.*

Bracts trifoliolate.
- Flowers in stalked umbels on naked axillary peduncles.
  - Whole plant subglabrous . . . . . 6. *L. corniculatus.*
  - Stem, leaves, and calyx densely grey-silky . . . . . 7. *L. creticus.*
- Flowers 1–2 together on the branches, and in 3–4-flowered quasi-terminal umbels . . . . . 8. *L. glinoides.*
- Flowers all solitary, axillary, subsessile . . . . . 9. *L. Garcini.*

1. **L. tigrensis,** *Baker.* Stems herbaceous, a foot long, diffuse, thinly silky upwards. Leaflets 5, oblanceolate, subsessile, 6–8 lines long, thinly silky. Flowers 6–8 in an umbel on a downy peduncle 1$\frac{1}{2}$–2 in. long. Bracts solitary, oblanceolate, 3–4 lines long. Pedicels downy, a line long. Calyx-tube campanulate, 1$\frac{1}{2}$–2 lines deep, the teeth deltoid-cuspidate, shorter than the tube. Corolla yellow, 5 lines long. Pod linear, glabrous, 12–18-seeded; not seen fully developed.

Nile Land. Abyssinia, Tigre, *Schimper!*
Like *L. arabicus* in size and general habit; different in the calyx.

2. **L. nubicus,** *Hochst. in Kotsch. Herb. Nub.* No. 311. Rootstock woody. Stems herbaceous, 3–6 in. long, copiously branched from the

base, spreading, grey-silky. Leaflets 3–5, short-stalked, obovate-cuneate, 3–4 lines long by half as broad, conspicuously grey-silky. Flowers 1–4 together on peduncles shorter than the leaflets, with a short-stalked bract like a leaflet from the base of the cluster. Pedicels silky, very short. Calyx $2\frac{1}{2}$ lines deep, teeth linear subequal, reaching three-quarters of the way down. Corolla reddish yellow, slightly exceeding the calyx. Pod linear-oblong, terete, 2–3 lines long, about 6-seeded.

Nile Land. Banks of the White Nile, near Mussa, *Kotschy!*

Var. β *montanus*, Baker; flower rather smaller; branches and leaves more silky, *L. montanus*, A. Rich. Fl. Abyss. i. 177.

Nile Land. Abyssinia, *Quartin-Dillon!*
Perhaps not distinct from *L. brachycarpus*, H. and S.

3. **L. brachycarpus,** *Hochst. et Steud. in Schimp. Hb. Abyss.* No. 242. Rootstock woody, the stems densely cæspitose, 12–18 inches long, spreading, wiry, glabrous or slightly silky upwards. Leaflets crowded, oblanceolate $\frac{1}{2}$–$\frac{5}{8}$ in. long, a third as broad, thick, fleshy, glabrous or slightly silky, the stipular pair like the others. Flowers 4–6 together, in copious axillary umbels with a stalked bract like a single reduced leaflet at the base. Pedicels very short. Peduncles 1–3 in. long. Calyx 3–4 lines long, more or less silky, teeth lanceolate-acuminate, reaching two-thirds of the way down, the lowest narrower and sometimes shorter than the others. Corolla reddish, a third longer than the calyx. Pod terete, glabrous, $\frac{3}{8}$ in. long, 4–6-seeded.—A. Rich. Fl. Abyss. i. 177. *Dorycnium Schimperi*, Jaub. et Spach. Illust. t. 473.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Parkyns!*
Abyssinian name *Hamat-Jemamberri.*
Differs from *L. arabicus* principally in the short pod.

4. **L. arabicus,** *Linn.*; *DC. Prod.* ii. 212. Stems herbaceous, a foot or more long, copiously branched from the base, prostrate or suberect, glabrous or slightly silky. Leaflets 5, all short-stalked, obovate-cuneate, entire, $\frac{1}{4}$–$\frac{1}{2}$ in. long by half as broad, pointed, both sides glabrous or thinly silky, the stipular pair like the others. Flowers usually 2–4 together, rarely solitary, on axillary peduncles $\frac{1}{4}$–1 in. long with a short-stalked bract like a leaflet from the base of the cluster. Pedicels under a line long, glabrous or silky. Calyx 3–4 lines deep; teeth linear, subequal, reaching three-quarters of the way down. Corolla reddish, slightly exceeding the calyx. Pod $\frac{3}{4}$–$1\frac{1}{2}$ in. long, 1–$1\frac{1}{2}$ line thick, terete, glabrous, subtorulose, 10–12-seeded.—Guill. et Perr. Fl. Seneg. 162. A. Rich. Fl. Abyss. i. 177.

Upper Guinea. Senegambia: plentiful on the banks of the Senegal, *Leprieur, Perrottet! Heudelot.*
Nile Land. Banks of the White Nile, *Kotschy!* Abyssinia, *Schimper! Roth!*
Mozamb. Distr. Zambesi land, *Peters.*
A common Egyptian species, and extending from Greece to Beloochistan.

5. **L. mossamedensis,** *Welw. mss.* A copiously branched diffuse annual with finely grey-silky stems under a foot long. Leaflets 5,

oblanceolate or obovate, blunt with a mucro, 6-9 lines long, glaucous, finely grey-silky, slightly fleshy. Flowers usually solitary, rarely geminate, on axillary peduncles 6–12 lines long. Bracts oblanceolate, usually solitary. Calyx 3–4 lines long, finely silky, the subequal linear-setaceous teeth reaching three-quarters of the way down. Corolla light rose-red, equalling the calyx. Pod linear, 9–12 lines long, $\frac{1}{8}$ in. thick, glabrous, brown, not torulose, 12–15-seeded.

Lower Guinea. Benguela; damp sandy ground by the river Bero, *Dr. Welwitsch!*

6. **L. corniculatus,** *Linn.; DC. Prod.* ii. 214. Stem 6–18 in. long, diffusely branched, glabrous or thinly silky. Leaflets subsessile, obovate-cuneate, 6–9 lines long, glabrous. Flowers 4–9, in an umbel on a peduncle 1–2 in. long, with a compound bract. Pedicels a line long. Calyx $\frac{1}{4}$ in. long, glabrous or slightly silky, the teeth lanceolate-cuspidate, reaching more than halfway down. Corolla yellow, twice as long as the calyx. Pod $\frac{3}{4}$–1 in. long, 1 line broad, straight. A. Rich. Fl. Abyss. i. 176.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*

This is the common form, which is diffused throughout Europe, and reaches Japan and Australia. We have specimens gathered by Dr. Quartin-Dillon, like the Spanish var. *glacialis* of Boissier with silky stems 6 in. long, much smaller leaflets and flowers; the latter 1–3 together, with 1 or 2 very small sessile bracts.

7. **L. creticus,** *Linn.; DC. Prod.* ii. 211. A diffuse copiously-branched perennial 1–2 ft. high, sometimes suffruticose, the branches densely grey-silky. Leaflets 5, rather fleshy, oblanceolate-cuneate, 4–6 lines long, both sides densely grey-silky. Flowers in umbels of 4–8 on axillary peduncles 9–18 lines long. Pedicels very short. Bracts compound, equalling or shorter than the calyx. Calyx 4 lines long, densely grey-silky, the linear teeth equal to the tube. Corolla yellow, twice the calyx. Pod linear, 12–18 lines long, turgid, glabrous, 9–15-seeded.

Nile Land. Abyssinia (*teste Schweinfurth*).

A common Mediterranean species.

8. **L. glinoides,** *Delile in Ann. Sc. Nat.* ser. 2, vii. 286. Stems herbaceous, a foot or more long, thinly grey-silky. Leaflets 5, obovate-cuneate, 4–5 lines long, rather fleshy, glaucous, thinly grey-silky. Flowers solitary or in pairs on short pedicels in the axils of the leaves, or in clusters of 3–4 as if terminal on short leafy branches. Bracts trifoliolate. Calyx 4 lines long, densely silky, the linear teeth reaching three-quarters of the way down. Corolla reddish, scarcely exceeding the calyx. Pod linear, glabrous, 8–9 lines long, slightly torulose, 8–10-seeded.—Walp. Rep. i. 647.

Nile Land. Nubia, *Kotschy!* Abyssinia (*teste Schweinfurth*).

9. **L. Garcini,** *DC. Prod.* ii. 212. Suffruticose, stems 6–12 in. long, twiggy and diffusely branched, clothed with adpressed grey pubescence. Leaves scattered, digitately trifoliolate. Leaflets obovate-cuneate, entire, 1–3 lines long by half as broad, tomentose. Flowers

copious, sessile, solitary, axillary. Calyx ¼ in. long, shaggy, the lanceolate teeth reaching more than three-quarters of the way down to the base. Corolla reddish, equalling the calyx, anthers not quite uniform. Pod ⅜ in. long, under a line thick, straight, linear, glabrous, about 6-seeded.—*Ononis Aucheri*, Jaub. et Spach. Illust. i. 96.

Nile Land. Banks of the White Nile, *Kotschy!*

A desert species, extending eastward to Scinde, with the habit of an *Ononis*, and receding from the typical *Loti* by its anthers, which are alternately fastened quite at the base, and slightly versatile.

16. **PSORALEA.** Linn.; Benth. et Hook. f. Gen. Plant. i. 491.

Calyx-teeth in our plant subequal. Petals equal or the keel shorter; standard ovate or orbicular, unguiculate; wings oblong subfalcate; keel incurved, obtuse. Upper stamen free or more or less connate, the tube in an early stage often closed; anthers small, uniform or the alternate ones slightly different. Ovary sessile or short-stalked, 1-ovulate; style filiform, or dilated at the base, upcurved; stigma terminal. Pod ovate or oblong indehiscent, the pericarp adhering to the seed.—Herbs or undershrubs with glandulose-punctate leaves and 1, 3, or many pinnate leaflets, the flowers in heads or spikes or racemes, rarely solitary.

A large genus, principally Cape, South American, and Australian.

Leaves pinnately trifoliolate, flowers in axillary racemes.

A low spiny shrub	1. *P. plicata.*
An unarmed prostrate herb	2. *P. obtusifolia.*
Leaves simple; flowers in dense stalked terminal heads	3. *P. andongensis.*

1. **P. plicata,** *Del.; DC. Prod.* ii. 221. A low shrub with striated glabrous woody stems, copious erecto-patent rigid branches and spiny branchlets. Leaves pinnately trifoliolate, the petioles ¼–¾ in. long, terminal leaflet ¼–⅝ in. long, half as broad, oblong, deeply crenate, lateral ones smaller, firm, both sides coated with fine silvery pubescence. Flowers in copious short-stalked axillary racemes of 6–12 flowers each. Pedicels very short. Calyx tubular, 1½–2 lines long, 10-nerved, silvery, the teeth deltoid, not reaching a quarter of the way down, the lower one rather narrower and deeper, the tube dilated when the fruit is produced. Corolla cream-coloured, scarcely exceeding the calyx. Pod villose, ultimately black, equalling the calyx.

North Central. Banks of Lake Tschad, *E. Vogel!*

Nile Land. Banks of the Nile in Nubia, *Kotschy! Ehrenberg, Bromfield!* and gathered also by *Speke and Grant!*

2. **P. obtusifolia,** *DC. Prod.* ii. 221. A finely-silky copiously-branched prostrate perennial herb with stems 1–2 ft. long. Petioles spreading, 6–10 lines. Leaflets 3, obovate-cuneate, rather fleshy, blunt, crenato-repand, both sides green, finely grey-silky, the central one distinctly stalked, obscurely punctate, 6–9 lines long. Flowers 4–6 in copious short-stalked dense axillary spikes. Calyx 1½ lines long, densely white-silky, the lanceolate teeth shorter than the tube. Corolla bright yellow, slightly exceeding the calyx. Pod sessile, ovate-

elliptical, densely grey-silky, equalling the calyx.—Harv. Fl. Cap. ii. 156.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch!*
A Cape species.

3. **P. andongensis,** *Welw. mss.* A herbaceous perennial, branched at the crown of the root with many stiff erect subsimple finely grey-downy stems a foot high. Stipules $\frac{1}{4}$ in., lanceolate, persistent. Petioles 1 line. Leaves few, simple, ovate-oblong, reaching $2\frac{1}{2}$–3 in. long, 15–18 lines broad, blunt, coriaceous, dull green on both sides, finely grey-silky beneath. Flowers subsessile in many dense small close round or oblong peduncled terminal heads, the lower ones with a linear bract and three setaceous bracteoles. Calyx $\frac{1}{8}$ in., tubular, densely grey-silky, teeth linear, densely ciliated, as long as the tube. Corolla whitish, slightly exceeding the calyx. Ovary densely grey-silky, subsessile. Pod not seen.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 feet, *Dr. Welwitsch!*
Habit and leaves of the Cape *P. Thomii,* Harv.

17. **CYAMOPSIS,** DC.; Benth. et Hook. f. Gen. Plant. i. 493.

Calyx broad, oblique, the lowest teeth the longest. Standard obovate, sessile; wings oblong, free from the keel, which is slightly upcurved, obtuse, not appendiculate. Stamens all connate in a closed tube; anthers uniform, the connective projecting so as to form an apiculus. Ovary sessile, ∞-ovulate; style upcurved; stigma capitate. Pod linear, subtetragonous, cuspidate, many-seeded, 2-valved, with dissepiments between the seeds.—Erect herbs with pinnate leaves and small flowers in lax axillary racemes.

Two species, the other E. Indian.

1. **C. senegalensis,** *Guill. et Perr. Fl. Seneg.* i. 174, t. 45. Stems herbaceous, 6–12 in. long, terete, copiously and diffusely branched from the base, slightly silky. Stipules minute, setaceous. Petioles $\frac{1}{2}$–1 in. long. Leaflets 3–7, subsessile, linear or oblanceolate, $\frac{1}{2}$–1 in. long, 2–3 lines broad, thinly silky beneath. Flowers in short-stalked lax axillary racemes of 4–6 each. Lower pedicels equalling the calyces, subtended by small linear bracts. Calyx campanulate, $\frac{1}{8}$ in. deep, the lower teeth lanceolate, reaching halfway down, the upper broader and shorter. Corolla reddish, twice as long as the calyx, the wings and keel exceeding the standard. Pod 1–$1\frac{1}{2}$ in. long, 2–$2\frac{1}{2}$ lines broad, linear, cuspidate, glabrous, horizontally striated, 6–9-seeded.

Upper Guinea. Senegambia, *Leprieur and Perrottet!*
Nile Land. Kordofan, *Kotschy!* (A form with narrow linear leaves also found in Arabia.)

18. **INDIGOFERA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 494.

Calyx small, oblique, campanulate or tubular, teeth equal or the lowest longer than the rest. Standard ovate or orbicular, sessile or

unguiculate; wings oblong, adhering a little to the keel; keel obtuse or acuminate, gibbous or spurred on both sides. Upper stamen free from the base, the others connate; anthers uniform, the connective forming an apiculus. Ovary sessile or nearly so, usually with several, sometimes with only one or two ovules; style glabrous; stigma capitate. Pod linear or oblong, rarely globose, straight or curved, terete or tetragonous or compressed, septate internally.—Herbs or shrubs of very various habit, more or less clothed with adpressed silky hairs fixed by the middle, and sometimes also with laxer pubescence. Leaves in our species simple or pinnately 3– ∞-foliolate.

A large genus, nearly restricted to the Tropics, except in South Africa, with a greater number of species in Africa than anywhere else, not less than 200, including the Cape and Mascarene forms.

§ **Acanthonotus,** *Benth.* Ovary uniovulate. Pod short, falcate, subtriquetrous, the dorsal suture dilated and prickly.

The only species . . . . . 1. *I. echinata.*

§§ **Sphæridiophora,** *Desv.* Pod small, subglobose or ovoid, 1-seeded, unarmed.

Leaves simple, linear, silvery . . . . . 2. *I. linifolia.*
Leaves imparipinnate, not silvery.
Leaflets 3–5, 3 lines long . . . . . 3. *I. terminalis.*
Leaflets 5–7, 6–8 lines long . . . . . 4. *I. congesta.*
Leaflets 7–13 . . . . . 5. *I. macrocalyx.*

§§§ **Euindigofera.** Pods linear, terete or subtetragonous, 2- or many-seeded, unarmed.

Group 1. **Simplicifoliæ.**—*Leaves simple.*

Inflorescence copiously panicled.
Pod terete, glabrous, 4-seeded . . . . . 6. *I. paniculata.*
Pod subcompressed, villose, 2-seeded . . . . . 7. *I. procera.*
Flowers 1–2, pedicellate in the axils of the leaves.
Leaves obovate, ¼ in. long . . . . . 8. *I. Bainesii.*
Leaves linear, 1 in. long . . . . . 9. *I. tetrasperma.*
Flowers in dense sessile axillary clusters . . . . . 10. *I. cordifolia.*
Flowers in lax axillary racemes.
Leaves linear, subsessile.
Pod under an inch long, 5–6-seeded . . . . . 11. *I. simplicifolia.*
Pod 1½–2 in. long, 12–15-seeded . . . . . 12. *I. macrocarpa.*
Leaves oblong or lanceolate, short-stalked.
Herbaceous, with copious soft spreading pubescence.
Petiole 1–2 lines long; racemes 2–8-flowered . . . . 13. *I. erythrogramma.*
Petiole ½ in. long; racemes 15–20-flowered . . . . 14. *I. flavicans.*
Shrubby, with adpressed grey bristles . . . . . 15. *I. Knobl[illegible]cheri.*
Leaves obovate subsessile . . . . . 16. *I. bongensis*
Leaves round-obovate, stalked . . . . . 17. *I. nummularia.*

Group 2. **Conjugatæ.**—*Leaflets* 2, *a large terminal one and a small lateral one.*

Leaflets suborbicular, argenteous . . . . . 18. *I. diphylla.*
Leaflets oblanceolate, glabrescent . . . . . 19. *I. conjugata.*

Group 3. **Capitatæ.**—*Leaves imparipinnate. Flowers in dense terminal heads.*

Bracts leaflike, pinnate . . . . . 20. *I. capitata.*
Bracts broad, trifid, densely imbricated . . . . . 21. *I. strobilifera.*

GROUP 4. **Paniculatæ.**—*Leaves imparipinnate. Flowers in panicles.*

Leaflets 13–17 . . . . . 22. *I. Brassii.*
Leaflets 3–7.
  Stipules foliaceous . . . . . 23. *I. sericea.*
  Stipules setaceous.
    Pod exserted . . . . . 24. *I. pulchra.*
    Pod equalling the calyx . . . . . 25. *I. bracteolata.*

GROUP 5. **Spinosæ.**—*Leaves imparipinnate. Strong spiny bushes with flowers from the spines.*

Pod glabrous; leaflets 1–3 . . . . . 26. *I. spinosa.*
Pod coated with stalked glands; leaflets 5–7 . . . . . 27. *I. Rothii.*

GROUP 6. **Trichopodæ.**—*Leaves imparipinnate. Flowers solitary or rarely geminate on slender peduncles from the axils of the leaves.*

Peduncles 1–2 in. long . . . . . 28. *I. trichopoda.*
Peduncles 6–9 lines long.
  Densely silky, suffruticose . . . . . 29. *I. nigricans.*
  Subglabrous, herbaceous.
    Pod oblong, 2-seeded . . . . . 30. *I. nigritana.*
    Pod linear, 6–8-seeded . . . . . 31. *I. sparsa.*

GROUP 7. **Sessilifloræ.**—*Leaves imparipinnate. Flowers in sessile clusters in the axils of the leaves.*

Leaflets 3–5 jugate; pod 5–6-seeded . . . . . 32. *I. sessiliflora.*
Leaflets 1–2-jugate; pod 2–3-seeded . . . . . 33. *I. trigonelloides.*

GROUP 8. **Dissitifloræ.**—*Leaves imparipinnate. Flowers in lax 2–6-flowered axillary racemes.*

Racemes short, subsessile.
  Argenteous; leaflets 1–5 . . . . . 34. *I. arenaria.*
  Slightly argenteous; leaflets 9–11 . . . . . 35. *I. concinna.*
  Grey-villose; leaflets 5 . . . . . 36. *I. grisea.*
Racemes distinctly stalked.
  Suffruticose.
    Stipules setaceous . . . . . 37. *I. suaveolens*
    Stipules foliaceous . . . . . 38. *I. parvula.*
  Herbaceous, annual or biennial.
    Pods 4–6-seeded.
      Flowers in pairs . . . . . 39. *I. geminata.*
      Flowers 3–6 in a raceme . . . . . 40. *I. vicioides.*
    Pods 10–12-seeded.
      Pods and stem glanduloso-setose . . . . . 41. *I. viscosa.*
      Pods and stem pilose . . . . . 42. *I. pilosa.*
      Pods and stem glabrescent.
        Leaflets 2–4-jugate . . . . . 43. *I. pentaphylla.*
        Leaflets 6–8-jugate . . . . . 44. *I. multijuga.*

GROUP 9. **Stenophyllæ.**—*Leaves imparipinnate with linear or narrowly oblanceolate leaflets. Flowers in elongated racemes. All suberect annuals.*

Racemes shorter than the leaves.
  Leaflets 2–3-jugate . . . . . 45. *I. parviflora.*
  Leaflets 5–6-jugate . . . . . 46. *I. stenophylla.*
  Leaflets 9–10-jugate . . . . . 47. *I. Prieureana.*
Racemes exceeding the leaves.
  Leaflets 3 . . . . . 48. *I. Welwitschii.*
  Leaflets 5–7 . . . . . 49. *I. psilostachya.*

Leaflets up to 11–13.
Pod 6–8 lines long, 5–6-seeded . . . . . 50. *I. Heudelotii.*
Pod 12–18 lines long, 12–15-seeded . . . . . 51. *I. goniodes.*

Group 10. **Tinctoriæ.**—*Leaves imparipinnate with obovate leaflets. Flowers in many-flowered racemes. Shrubs or herbs.*

Leaflets 3–5.
Herbaceous; annuals or biennials, not argenteous.
Calyx-teeth lanceolate, as long as the tube.
Leaflets oblanceolate . . . . . 52. *I. crotalarioides.*
Leaflets roundish . . . . . 53. *I. medicaginea.*
Calyx-teeth setaceous, much exceeding the tube.
Stems trailing; petiole very short . . . . . 54. *I. oxalidea.*
Stems ascending; petiole 6–9 lines.
Leaflets usually 3, densely bristly . . . . . 55. *I. trita.*
Leaflets usually 5, subglabrous . . . . . 56. *I. subulata.*
An argenteous perennial herb.
Argenteous woody shrubs . . . . . 57. *I. benguellensis.*
Calyx-teeth linear-setaceous; pod 3–4-seeded . . . . . 58. *I. inhambanensis.*
Calyx-teeth lanceolate; pod 6–8-seeded . . . . . 59. *I. paucifolia.*
Leaflets 5–9.
Annual or biennial herbs, with soft spreading pubescence, and opposite leaflets.
Pubescence brown; seeds 6–8 . . . . . 60. *I. hirsuta.*
Pubescence white; seeds 4–5 . . . . . 61. *I. astragalina.*
Subglabrous annual with alternate leaflets . . . . . 82. *I. endecaphylla.* var. *radicans.*
Argenteo-canescent herbs, with alternate leaflets.
Pubescence adpressed, silvery . . . . . 62. *I. alternans.*
Pubescence cottony, short-spreading . . . . . 63. *I. maritima.*
Thinly grey-hispid perennials, with small opposite oblanceolate leaflets.
Racemes laxly 6–12-flowered . . . . . 64. *I. heterocarpa.*
Racemes dense, 2–3 inches long . . . . . 65. *I. setiflora.*
Thinly grey-hispid perennial, with small opposite oblong leaflets . . . . . 66. *I. mimosoides.*
Shrubs with subglabrous or thinly grey-hispid branches and opposite leaflets.
Racemes sessile, conical . . . . . 67. *I. torulosa.*
Racemes short-stalked, subcorymbose . . . . . 68. *I. subcorymbosa.*
Racemes distinctly stalked, 2–4 inches long.
Calyx-teeth deltoid, short.
Leaflets 6–8 lines long . . . . . 69. *I. Binderi.*
Leaflets 2½–3 inches long . . . . . 70. *I. rhynchocarpa.*
Calyx-teeth linear-subulate, exceeding the tube.
Leaflets 6–9 lines long . . . . . 71. *I. Spachii.*
Leaflets 12–18 lines long . . . . . 72. *I. Quartiniana.*
Argenteous shrubs, with opposite leaflets.
Pod 4–5 lines long, 2–4-seeded . . . . . 73. *I. semitrijuga.*
Pod 15–16 lines long, many-seeded . . . . . 74. *I. pruinosa.*
An argenteous shrub, with alternate leaflets . . . . . 75. *I. Schimperi.*
Leaflets 9–15.
Pods clothed with gland-tipped bristles.
Suffruticose, pod 6–8-seeded . . . . . 76. *I. atriceps.*
Herbaceous, pod 2–4-seeded . . . . . 77. *I. secundiflora.*
Pods glabrous or subglabrous, not glanduloso-setose.
Herbs with opposite leaflets.
Pod 2–3-seeded, oblong . . . . . 78. *I. Perrottetii.*
Pod 15–20-seeded, linear . . . . . 79. *I. costata.*

Herbs with alternate leaflets.
Argenteous; pod 9–10-seeded . . . . . 80. *I. daleoides.*
Grey-pubescent; pod 2–3-seeded . . . . . 81. *I. enneaphylla.*
Subglabrous; pod 6–8-seeded . . . . . 82. *I. endecaphylla.*
Suffruticose, with small opposite leaflets.
Leaflets 3–4 lines long; seeds numerous . . . . . 83. *I. phyllanthoides.*
Leaflets 6–9 lines long; seeds 1–2 . . . . . 84. *I. subulifera.*
Shrubs, with opposite leaflets, and very small calyces, with short teeth.
More or less silvery, with leaves turning blackish when dried. The indigo-yielding species.
Leaflets oblanceolate.
Pod oblong, 2–3-seeded . . . . . 85. *I. amorphoides.*
Pod linear, 6–8-seeded . . . . . 86. *I. arrecta.*
Leaflets obovate or oblong.
Pod reflexed, sickle-shaped.
Densely argenteous; leaflets usually 9 . . . 87. *I. argentea.*
Slightly argenteous; leaflets 13–17 . . . . 88. *I. Anil.*
Pod straight.
Racemes dense, subsessile.
Pod 6-8-seeded . . . . . 89. *I. umbonata.*
Pod 8–12-seeded . . . . . 90. *I. orthocarpa.*
Racemes lax, stalked . . . . . 91. *I. tinctoria.*
Not at all silvery, the leaves glabrous when mature, not turning black.
Racemes much shorter than the leaves . . . . . 92. *I. emarginella.*
Racemes exceeding the leaves . . . . . 93. *I. macrophylla.*
Leaflets 15–30.
Herbaceous, subglabrous . . . . . 94. *I. dendroides.*
Herbaceous, densely viscid . . . . . 95. *I. viscidissima.*
Shrubby; leaflets 5–6 lines long . . . . . 96. *I. sutherlandioides*
Shrubby; leaflets 10–15 lines long . . . . . 97. *I. fulgens.*

§§§§ **Amecarpus.**—Pods linear, flattened, bi- or multiovulate, unarmed.
Pod recurved.
Peduncle very short . . . . . 98. *I. Hochstetteri.*
Peduncle 1–2 inches long . . . . . 99. *I. oligophylla.*
Pod straight.
Pod linear, 10–12-seeded . . . . . 100. *I. aspera.*
Pod two to three times as long as broad, 3–5-seeded.
Leaflets linear . . . . . 101. *I. senegalensis.*
Leaflets obovate . . . . . 102. *I. arabica.*
Pod 2-seeded . . . . . 103. *I. ervoides.*

1. **I. echinata,** *Willd.; DC. Prod.* ii. 198. Stems herbaceous, 1–2 ft. long, branched copiously from the base, and sometimes also upwards, moderately thick, 2-edged, finely pubescent. Stipules linear-setaceous. Leaves simple, subsessile, elliptical or obovate, $1\frac{1}{2}$–2 in. long, mucronate, both sides finely pubescent. Flowers in lax racemes an inch long of 6–10 flowers each from the axils of the leaves, on slender erect peduncles about the same length. Pedicels short. Calyx campanulate, $\frac{1}{8}$ in. deep, the setaceous subequal segments reaching down nearly to the base. Corolla twice as long as the calyx. Pod $\frac{3}{4}$ in. long, oblong-falcate cuspidate, triquetrous, 1-seeded, the upper edge entire, the two lower ones with each a double row of strong spreading prickles.—Wight. et Arn. Prod. Fl. Ind. Or. 198. *Acanthonotus,* Benth. Fl. Nigr. 293.

Upper Guinea. Guinea proper, *Vogel!* *Barter!* Senegambia, *Heudelot!*
A plant of Peninsular India and Ceylon. The African plant has larger, more pubescent and more elliptical leaves than the Indian one, and more conspicuous stipules.

2. **I. linifolia,** *Retz.*; *DC. Prod.* ii. 222. Annual, 6–9 in. high, copiously and diffusely branched, branches terete, erecto-patent, slender, clothed with silvery-silky pubescence. Stipules minute, setaceous. Leaves sessile, simple, linear, 1½–2 in. long, ½–¾ line broad, narrowed gradually to both ends, acute, both sides, especially the lower one, more or less densely clothed with silvery-silky pubescence. Flowers in copious close sessile axillary racemes ¼–½ in. long of 6–12 each. Calyx campanulate, silvery, a line deep, the teeth linear, reaching three-quarters of the way down, the two lowest much the longest. Corolla reddish, three times as long as the calyx, the standard a line broad. Pod round with an apiculus, a line thick, like the rest of the plant silvery-white, never more than 1-seeded.—*Sphæridiophorum linifolium*, Desv. Journ. Bot. v. iii. 125, tab. 6. *S. abyssinicum*, Jaub. et Spach. Ill. t. 494.

Nile Land. Nubia, *Schweinfurth!* Abyssinia, *Schimper!*
The western limit of the species, which is spread through Tropical Asia as far east as North Australia.

3. **I. terminalis,** *Baker.* Main stem woody, with dark shining purplish-brown bark, the branches copious slender erecto-patent and again branched, the ultimate branchlets slender, terete, downy, not at all silvery. Stipules linear-setaceous. Petiole ¼–½ in. long, spreading, pilose like the branchlets. Leaflets 3–5, obovate-oblong, ¼ in. long, 1–1½ lines broad, apex rounded and mucronate, the lateral ones opposite on short stalks, texture firm, both surfaces with a few adpressed strong hairs. Flowers in moderately dense oblong terminal heads, which are 1–1½ in. long. Bracts linear, equalling the flowers. Calyx ⅛ in. deep, not at all silvery, cut down nearly to the base, the teeth linear, ½–¾ line broad, distinctly ciliated. Corolla equalling the calyx. Pod ovoid, mucronate, ⅛ in. long, thinly silky, single-seeded.

Upper Guinea. Senegambia, *Heudelot!*

4. **I. congesta,** *Welw. mss.* An undershrub with an erect almost woody stem sometimes 4 ft. high, with copious erecto-patent firm terete finely downy branches. Stipules firm, rigid, linear. Petioles spreading, ¼–⅜ in. long. Leaflets 5–7, oblong or slightly obovate, ½–⅝ in. long, apex rounded and mucronate, the lateral ones distant, opposite, nearly sessile, both sides, especially the under one, grey-green, and finely downy. Flowers in dense rounded axillary clusters of 12–20, aggregated towards the end of the branches with the leaves diminished to trifoliolate bracts. Pedicels equalling the calyx, which is ⅛ in. deep, the teeth linear-setaceous, subequal, reaching down nearly to the base. Corolla scarlet, equalling the calyx. Pod oblong, subterete, not exceeding the calyx, thinly silky, single-seeded.

Upper Guinea. Niger country, Onitcha, *Barter* 1791!
Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Resembles *I. pulchra* in general habit, but the leaves and clusters considerably larger.

5. **I. macrocalyx,** *Guill. et Perr. Fl. Seneg.* 175, t. 46. Stem herbaceous, 1–1½ ft. long, decumbent or suberect, copiously branched from the base, the branches firm, slender, scarcely at all silvery. Stipules minute, setaceous, deciduous. Petiole ½ in. long. Leaves 1½–2 in. long, with 3–6 pairs of leaflets, which are oval-oblong, or slightly obovate, apex rounded and mucronate, the lateral ones on short stalks, both sides green and thinly coated with strong adpressed grey hairs. Flowers in dense oblong-conical terminal heads 1 in. or more long. Bracts linear, ciliated, ¼ in. long. Calyx silvery, 2 lines deep, cut down nearly to the base, the teeth unequal, lanceolate or lanceolate-oblong, ½–¾ line broad. Corolla rose, silky on the outside, slightly shorter than the calyx. Pod roundish, pointed, ⅛ in. each way, slightly silky, 1-seeded.

Upper Guinea. Guinea proper, *Barter!* Senegambia, *Perrottet!* Sierra Leone, *Afzelius!*

6. **I. paniculata,** *Pers.; DC. Prod.* ii. 222. Stem suffruticose, very much branched, the branches twiggy. Petioles shorter than the leaves, which are simple, linear-oblong, subglabrous. Flowers in elongated terminal panicles. Pods terete, deflexed, glabrous, 4-seeded.

Upper Guinea. Guinea, *Vahl, in Herb. Jussieu.* This I have not seen.

7. **I. procera,** *Schum. et Thonn.; DC. Prod.* ii. 222. An undershrub 4–6 ft. high, with copious slender firm twiggy striated branches, the young ones finely silky. Stipules small, setaceous. Leaves simple, linear-oblong, 1–1½ in. long, ¼ in. broad, the lower half narrowed gradually to a very short petiole, firm, both sides finely punctate, the under one grey-green and minutely downy with the midrib raised. Flowers in a long very compound terminal panicle sometimes a foot long, with copious rigid erecto-patent branches, the bracts at the base of the lowest branches like leaves, and higher up growing smaller gradually. Flowers laxly racemose on the branchlets, the lower pedicels a line long. Calyx campanulate, slightly silky, ½ line deep, the teeth linear-setaceous, reaching down nearly to the base, the two lowest longer than the others. Corolla scarlet, three or four times as long as the calyx, the standard a line broad. Pod linear-oblong, 2½–3 lines long, ½ line thick, compressed, villose, 2-seeded.

Upper Guinea. Senegambia, *Heudelot!* Guinea proper, *Thonning. Vogel! Barter!*

Lower Guinea. Ambaca and Pungo Andongo, Angola, *Dr. Welwitsch!*

8. **I. Bainesii,** *Baker.* Shrubby, copiously branched, branches woody, the ultimate branchlets subtetragonous, thinly silvery. Leaves sessile, simple, obovate, folded together, ¼ in. long, half as broad, mucronate, texture firm, both sides slightly silvery. Flowers solitary in the axils of the crowded deciduous leaves. Pedicels equalling the calyx, which is campanulate, thinly-silvery, about a line long, the lower teeth subulate, reaching more than halfway down, upper ones much shorter. Corolla reddish, three times as long as the calyx. Pod linear, ½–⅝ in.

long, 1 line thick, mucronate, subterete, thinly clothed with adpressed silky hairs, many-seeded.

South Central. In the interior, near the Tropic of Capricorn, *Baines!*

9. **I. tetrasperma,** *Schum. et Thonn. Pl. Guin.* 365. A suberect much branched undershrub 1–2 ft. high, with long firm slender woody branches, the upper part striated and thinly silky. Stipules minute, subulate, deciduous. Leaves nearly sessile, simple, linear, 1–1¼ in. long, ⅛ in. broad, apex rounded and mucronate, the texture firm, both sides scabrous, with copious strong adpressed hairs. Flowers in the axils of the leaves on suberect firm pedicels ¼ in. long, solitary, or if in pairs only one producing seed. Calyx campanulate, minute, teeth acute. Corolla scarlet. Pod linear with a mucro, ⅛ in. long, 1 line thick, subtetragonous, with a few short adpressed hairs, 4-seeded.

Upper Guinea. Guinea proper, *Thonning.* Senegambia, *Heudelot!*

This was named under the impression that it was a plant briefly described under the name of *tetrasperma* by Persoon (*Ench. Bot.* ii. 325; *DC. Prodr.* ii. 222); but according to Webb, who examined an authenticated specimen in the herbarium of Desfontaines, this latter is *I. senegalensis*.

10. **I. cordifolia,** *Roth; DC. Prod.* ii. 222. Stems herbaceous, 6–9 in. long, copiously and diffusely branched, the branches slender, terete, clothed with spreading cottony pubescence. Leaves subsessile, simple, cordate-ovate, ½–⅝ in. long, ¼–⅜ in. broad, pointed, the upper surface grey subglabrous, the lower clothed more or less densely with cottony pubescence like that of the stem. Flowers in dense sessile clusters of 3–6 each in the axils of most of the leaves. Calyx cottony, tubular, about 2 lines long, the teeth linear-setaceous, plumose, reaching three-quarters of the way down. Corolla red, equalling the calyx. Pod oblong cuspidate, 2 lines long, under 1 line thick, cottony, 2- or sometimes only 1-seeded, slightly exceeding the calyx.

Nile Land. Nubia, Kordofan and Sennaar, *Kotschy! Schweinfurth!* Abyssinia, *Schimper!*

This also is East Indian, Malayan, and N. Australian.

11. **I. simplicifolia,** *Lam.; DC. Prod.* ii. 222. Stem rigidly erect, 3–4 ft. high, suffruticose, the branches firm, slender, slightly adpressed grey-silky. Stipules minute, setaceous. Leaves simple linear subsessile, 1–1½ in. long, 1–1½ lines broad, texture firm, both sides slightly grey-hispid. Flowers in short subsessile 3–4-flowered racemes in the axils of the leaves. Bracts linear, pedicels short, calyx about a line deep, thinly silky, the teeth linear, reaching down nearly to the base. Corolla whitish, 4–5 times the calyx, the standard silky on the back. Pod not more than an inch long, a line thick, bluntly tetragonous, glabrous when mature, 5–6-seeded.

Upper Guinea. Sierra Leone, *Smeathmann! Afzelius!*
Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

12. **I. macrocarpa,** *Leprieur, mss.* Stem erect, suffruticose, 2–4 ft. high, with copious firm erecto-patent slender striated finely silky

branches. Stipules small, setaceous. Leaves simple, linear, subsessile, 2–4 in. long, $\frac{1}{4}$ in. broad, narrowed from the centre to both ends, texture firm, both sides thinly silky. Flowers in lax sessile racemes of 6–12 flowers each, which are considerably shorter than the leaves. Bracts linear, half as long as the tubular silky calyx, which is under $\frac{1}{4}$ in. long, the teeth setaceous, subequal, reaching three-quarters of the way down. Corolla reddish, slightly exceeding the calyx. Pod straight, linear, $1\frac{1}{2}$–2 in. long, 2 lines broad, compressed, with thickened sutures, 12–15-seeded.—*I. simplicifolia,* Guill. et Perr. Fl. Seneg. 173, non Lamarck.

Upper Guinea. Senegambia, *Perrottet!* Guinea proper, *Vogel! Barter!*

13. **I. erythrogramma,** *Welw. mss.* A diffuse annual or biennial with copiously branched stems a foot or less long clothed with short spreading grey pubescence. Stipules 2–4 lines, lanceolate acuminate persistent. Petiole 1–2 lines, densely grey-downy. Leaves oblong or lanceolate, reaching 2–3 in. long, 6–8 lines broad, acute or subacute, slightly rounded or narrowed at the base, both sides finely grey-hispid, upper dull green, lower glaucous, with the purplish parallel erecto-patent main veins distinctly marked. Flowers 2–8 together in copious short-peduncled axillary racemes. Pedicels $\frac{1}{2}$–1 line. Calyx 1 line, densely grey-hispid, the linear-setaceous teeth exceeding the tube. Corolla bright red. Pod linear, 5–6 lines long, $\frac{3}{4}$ line broad, finely grey-downy, 8–10-seeded.

Lower Guinea. Huilla, Loanda, and Pungo Andongo, Angola, *Dr. Welwitsch!*

14. **I. flavicans,** *Baker.* Stem herbaceous, subterete, densely clothed with spreading or deflexed yellowish-grey silky hairs. Stipules linear-falcate, silky, $\frac{1}{4}$–$\frac{3}{8}$ in. long. Petioles $\frac{1}{2}$ in. long, densely silky. Leaves simple oblong, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, half as broad, the two ends nearly equal, thick and both sides soft with a coating of dense grey silky pubescence. Flowers in rather lax axillary racemes of 15–20 each, $1\frac{1}{2}$ in. long on peduncles less than half their length. Young heads plumose. Pedicels very short. Calyx silky, 2 lines long, the teeth setaceous, subequal, reaching down nearly to the base. Corolla not half as long again as the calyx, the standard round, $\frac{1}{8}$ in. broad, the wings subspathulate, the keel shorter. Ovary linear, multiovulate. Pod unknown.

South Central. In the interior, near the Tropic of Capricorn, *Baines!*

15. **I. Knoblecheri,** *Kotschy in Sitzungsb. Wien. Acad.* 1864, 362. Stem suffruticose, the branches and leaves clothed with adpressed grey hairs. Stipules linear, 2–3 lines. Leaves short-stalked, simple, lanceolate or oblanceolate, reaching 2–3 in. long, 3–4 lines broad, acute, narrowed to both ends, chartaceous, both sides scabrous with adpressed hairs. Racemes closely 20–30-flowered on peduncles which exceed the leaves. Pedicels 1 line. Calyx $\frac{1}{8}$ in., scabrous, the linear teeth exceeding the tube. Corolla bright red, twice the calyx. Pod linear,

slightly upcurved, an inch long, a line broad, hispid, 8–10-seeded. —Schweinf. Rel. Kotschy. t. 15.

Nile Land. Banks of the White Nile near Gondokoro, *Knoblecher.*

16. **I. bongensis,** *Kots. et Peyr. Pl. Tinn.* 8, t. 4. Stems herbaceous, slender, thinly adpressed-silky, the branches ascending. Stipules linear, $\frac{1}{8}$ in. long. Leaves simple, nearly sessile, obovate, an inch long by more than half as broad, apex rounded and mucronate, the upper surface green and glabrous, lower thinly adpressed grey-silky. Flowers from the axils in 20–30-flowered racemes $1\frac{1}{2}$–2 in. long on firm slender peduncles which about equal them, longer in fruit. Pedicels under a line long. Calyx campanulate, $\frac{1}{8}$ in. deep, grey-silky, the teeth linear, reaching two-thirds of the way down. Corolla purplish, twice as long as the calyx. Pod $\frac{1}{2}$–$\frac{3}{4}$ in. long, 1 line broad, linear, straight, silky, 6–7-seeded.

Nile Land. Nubia, *M. de Heuglin.*
Habit of *I. trita* and *subulata,* but simple-leaved.

17. **I. nummularia,** *Welw. mss.* Stems suffruticose, $1\frac{1}{2}$–2 ft. long, prostrate, with numerous spreading finely grey-downy branches. Stipules linear-setaceous, persistent, 3–4 lines. Leaves simple, rotundate-obovate, with a short distinct petiole, reaching 9–12 lines long, 7–8 lines broad, subcoriaceous, blunt with a distinct mucro, both sides green, scabrous with minute adpressed grey hairs. Flowers 4–8 in copious moderately dense axillary racemes on slender downy peduncles which about equal them. Calyx 1 line, densely grey-hispid, teeth setaceous, reaching down nearly to the base. Corolla bright red, $\frac{1}{8}$ in. Pod linear, 3–4 lines long, $\frac{3}{4}$ line thick, brown, finely grey-downy, straight, 4–5-seeded.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Very near the Cape *I. ovata,* Thunb.

18. **I. diphylla,** *Vent.; DC. Prod.* ii. 223. An undershrub, $1\frac{1}{2}$–2 ft. high, branched copiously and diffusely, the branches firm, terete, densely clothed with fine white spreading silky pubescence. Stipules linear-setaceous, silky, spreading. Leaves nearly sessile, with two unequal leaflets, the terminal one considerably the largest, suborbicular or obovate-cuneate, $\frac{1}{2}$–1 in. long, $\frac{1}{4}$ in. broad, on a petiolule $1\frac{1}{2}$–2 lines long, the lateral one smaller, sessile, spreading, apex rounded and mucronate, texture thick, both sides more or less densely clothed with spreading silvery pubescence like that of the stem. Flowers in copious dense oblong-conical racemes 1–$1\frac{1}{2}$ in. long, of 20–40 flowers each, nearly sessile, or on peduncles $\frac{1}{4}$ in. long from the axils of the leaves. Bracts linear, exceeding the pedicels. Calyx campanulate, very silky, $\frac{1}{8}$ in. deep, the teeth setaceous, reaching down nearly to the base, the lowest the longest. Corolla rose-pink, twice as long as the calyx. Pod sessile, linear, $\frac{3}{8}$–$\frac{1}{2}$ in. long, very silky, deflexed, 2–3-seeded, with a barren upcurved point, nearly half as long as the fertile portion.—Guill. et Perr., Fl. Seneg. 173; Klotzsch in Peters' Mossamb. 48.

Upper Guinea. Senegambia, *Perrottet!* and others.
Nile Land. Kordofan, *Kotschy!*
Mozamb. Distr. Mozambique, *Dr. Peters!*

19. **I. conjugata,** *Baker*. Suffruticose, ultimate branches firm, subtetragonous, thinly coated with white silvery hairs. Stipules linear, 2 lines long. Petiole $\frac{1}{8}$ in. long, tetragonous, silky. Leaves of two oblanceolate leaflets, the terminal one on a petiolule $\frac{1}{8}$ in. long, the blade 2–$2\frac{1}{2}$ in. long, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, narrowed from above the centre to both ends, the lateral one similar, smaller, sessile, erecto-patent, texture firm, the under surface thinly silky when young, both glabrous in the mature plant. Flowers in short-stalked lax axillary racemes 2 inches long, of more than 20 flowers each. Pedicels half as long as the campanulate calyx, which is $\frac{1}{8}$ in. deep, cut down nearly to the base into subulate teeth, the two lowest the longest. Corolla yellowish, twice as long as the calyx. Pods deflexed, linear mucronate, 1 in. long, 1 line thick, slightly silky, compressed, many-seeded.

Nile Land. Banks of the White Nile, *Petherick!*

20. **I. capitata,** *Kotschy, Pl. Binder.* 16, t. 6. A shrub with an erect stem; branches copious, woody, erecto-patent, not silvery. Stipules small, linear, rigid, deciduous. Petioles spreading, firm, $\frac{1}{4}$ in. long. Leaflets 7–9, oblanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $1\frac{1}{2}$–2 lines broad, the point narrowed or rather rounded with a sharp mucro, firm in texture, not at all silvery. Flowers in dense rounded terminal heads $\frac{3}{4}$–1 in. broad. Bracts pinnate with narrow linear divisions. Calyx 3–4 lines deep, cleft three-quarters of the way down, ciliated but scarcely at all silky. Corolla falling short of the calyx. Pod oblong-mucronate, 2 lines long by 1 line broad, 2-seeded, ultimately glabrous, chestnut-brown.

Upper Guinea. Senegambia, *Heudelot!* Old Calabar, *Mylne!*
Nile Land. Banks of the White Nile, *Binder! Petherick!* Open ground at Madi, *Speke and Grant!*
Lower Guinea. Congo, *Capt. Burton! Dr. Welwitsch!*

21. **I. strobilifera,** *Hochst. in Kotsch. Hb. Nub.* No. 236. Stem a foot or more high, herbaceous, the branches divaricate, firm, angular, clothed with loose pale brown silky pubescence. Stipules ovate-lanceolate, persistent, $1\frac{1}{2}$–2 lines broad. Petioles 2–3 lines long, spreading. Leaflets 5–7, oblong or oblanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 3–4 lines broad, the lateral ones opposite, sessile, pointed, both sides permanently clothed with dense pale brown, loose, silky pubescence, like that of the stem. Flowers in dense copious terminal heads, which are 1–2 in. long by more than half-an-inch broad, with large nearly round cordate slightly pointed bracts which entirely hide the flowers. Peduncles $\frac{1}{2}$–$\frac{3}{4}$ in. long. Bracts $\frac{1}{4}$–$\frac{3}{8}$ in. broad, densely imbricated, usually deeply bifid, in texture and silkiness resembling the leaves and stipules. Flowers 1–2 together, on pedicels $\frac{1}{8}$ in. long. Calyx $\frac{1}{8}$ in. deep, very silky, the teeth setaceous, reaching nearly down to the base. Corolla not more than equalling the calyx. Pod oblong, mucronate, 2–3 lines long, 1 line thick, subterete, 2–4-seeded. — *Eilemanthus strobilifer*, Hochst. in Flora, 1846, 593.

Nile Land. Kordofan, *Kotschy! Cienkowsky.* Banks of the White Nile, *Von Harnier.* Abyssinia (*teste Schweinfurth*).
Mozamb. Distr. Mozambique, *Forbes!*
A very distinct and remarkable species.

22. **I. Brassii,** *Baker.* Stems shrubby, copiously branched, branches densely clothed with grey spreading pubescence. Stipules $\frac{1}{4}$ in. long, linear-subulate. Leaves subsessile. Leaflets 13–17, oblanceolate, 4–5 lines long, $\frac{1}{8}$ in. broad, greyish-green, and densely clothed, especially below, with strong grey pubescence. Flowers in copious panicles crowded towards the end of the branchlets. Bracts like reduced leaves, simple or trifoliolate. Calyx $\frac{1}{8}$ in. deep, densely clothed with ferruginous pubescence, teeth lanceolate, reaching down to the base. Corolla reddish, equalling the calyx. Pod equalling the calyx, linear, densely ferruginous-pubescent.

Upper Guinea. Sierra Leone, *Brass!*
A very distinct species.

23. **I. sericea**, *Benth. mss.* Stem 1–2 ft. high, scarcely more than herbaceous, copiously branched, the branches erecto-patent, terete, clothed with fine loose pale brown silky pubescence. Stipules large, ovate or cordate acuminate. Petioles very short, erecto-patent. Leaflets 5, oblanceolate or obovate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, 2–3 lines broad, mucronate, the lateral ones opposite, distant, nearly sessile, both sides permanently clothed with dense pale brown silky pubescence. Flowers in copious panicles, crowded towards the end of the branchlets, 1–3 from each node. Calyx $\frac{1}{8}$ in. deep, silky, the teeth setaceous, reaching down nearly to the base. Corolla red, not more than equalling the calyx. Pod linear, mucronate, $\frac{1}{4}$ in. long, 1 line thick, finely silky, about 4-seeded.

Upper Guinea. Senegambia, *Heudelot! Bidjem!* Niger, Nupe, *Barter!*
South Central. In the interior, near the Tropic of Capricorn, *Chapman and Baines!*

24. **I. pulchra,** *Vahl; DC. Prod.* ii. 230. An undershrub with an erect stem 2–5 ft. high, with copious erecto-patent firm angular branches, the silvery hairs erecto-patent, moderately thick. Stipules minute, setaceous, silky. Petiole erecto-patent, varying from $\frac{1}{4}$ in. long to nearly obsolete. Leaflets 3–7, opposite, oblanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, the apex rounded, mucronate, both sides, especially the under one grey-green and finely pubescent. Flowers in a copious panicle formed of terminal clusters and smaller ones on short stalks from the axils of the upper simple leaves of the branchlets, the lower flowers sometimes solitary and nearly sessile. Calyx $\frac{1}{8}$ in. deep, densely clothed with ferruginous silky pubescence, the teeth linear-acuminate, subequal, reaching three-quarters of the way down. Corolla not much exceeding the calyx, scarlet, silky externally. Pod oblong, mucronate, 2–$2\frac{1}{2}$ lines long, $\frac{1}{8}$ in. thick, finely villose, 2-seeded.—*I. rufescens,* Poiret, Encycl. Suppl. iii. 148. *I. Dorycnium,* Fenzl in Flora, 1844. 312.

Upper Guinea. Senegambia, *Perrottet!* *Heudelot!* *Ingram!* Guinea proper, *Thonning.* *Barter!* and others.
Nile Land. Sennaar, *Kotschy!*
Lower Guinea. Loanda, and Pungo Andongo, *Dr. Welwitsch!*

25. **I. bracteolata,** *DC. Prod.* ii. 223. Stems suffruticose, 1–2 ft. long, copiously branched, trailing or suberect, the branches firm, slender, subterete, thinly clothed with fine spreading pubescence. Stipules linear, deciduous. Petioles very short. Leaves of the main branches with one or two pairs of leaflets and a terminal one, those of the branchlets simple, all obovate or ovate-oblong, 2–3 lines long, apex rounded and mucronate, the lateral ones distant and opposite, both sides grey-green and permanently clothed with adpressed silvery hairs. Flowers racemose on the branchlets with a bract like a leaflet from the base of each. Pedicels equalling the calyx. Calyx 1 line deep, silky, the teeth linear-lanceolate, reaching down nearly to the base. Corolla reddish, scarcely exceeding the calyx. Pod scarcely exceeding the calyx, oblong mucronate, 1- or 2-seeded.

Upper Guinea. Senegambia, *Perrottet!* *Heudelot!* Guinea, *Vogel!* *Barter!*
Nile Land. Nubia, *Kotschy!* More densely silvery than the Western specimens, and leaves sometimes nearly round.

26. **I. spinosa,** *Forsk.*; *DC. Prod.* ii. 232. A copiously branched stiff shrub with erecto-patent terete slightly argenteous woody branches and copious sharp rigid slender spines 1–1½ in. long. Stipules minute, setaceous. Petiole silvery, a line long. Leaves simple or digitately trifoliolate. Leaflets 3 lines long, obovate, mucronate, firm, both sides permanently silvery. Flowers solitary from the spines, 1–6 from each on short slender pedicels. Calyx campanulate, silvery, more than ½ line deep, the teeth lanceolate acuminate, reaching half way down. Bracts minute setaceous. Corolla more than twice as long as the calyx, reddish, silky on the outside. Pod linear-mucronate, ½ in. long, a line broad, argenteous when young, subtorulose, spreading, 6–9-seeded.—Jaub. et Spach. Illust. Pl. Orient. t. 490–1. *I. spiniflora*, Hochst. et Steud. in Schimp. Pl. Arab. No. 945.

Nile Land. Nubia, *Ehrenberg.* Abyssinia, *Schimper.* *Petit!*
Also a plant of Egypt and Arabia.

27. **I. Rothii,** *Baker.* A copiously branched woody shrub with erecto-patent terete slightly argenteous woody branches and copious sharp erecto-patent spines often 1½ in. long. Stipules linear. Leaflets 5–7, oblong or obovate, ¼–⅜ in. long, mucronate, the lateral ones opposite, subsessile, texture firm, both sides grey and thinly silvery. Flowers from the spines, solitary or 2–4 near together on cernuous strong silvery pedicels a line long. Calyx silvery, 2 lines deep, the teeth linear, reaching more than halfway down. Corolla silky externally, twice as long as the calyx, considerably larger than the average of the genus, the standard ¼ in. broad. Pod linear

mucronate, $\frac{5}{8}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. thick, straight, nearly terete, densely coated with strong stalked brownish-black glands, 5- or 6-seeded.

Nile Land. Abyssinia, *Dr. Roth!*

28. **I. trichopoda,** *Lepr. in Guill. et Perr. Fl. Seneg.* 177 t. 47. Stem herbaceous or slightly shrubby, 1–3 ft. high, erect, copiously branched, the branches slender, terete, finely downy. Stipules minute, linear. Petioles $\frac{1}{4}$–$\frac{3}{4}$ in. long, erecto-patent. Leaflets 7–9, obovate, $\frac{1}{4}$–$\frac{3}{8}$ in. long by about half as broad, the apex rounded and mucronate, the lateral ones opposite and short-stalked, both sides thinly silky. Flowers solitary, axillary, on slender rigid, erecto-patent pedicels 1–$1\frac{1}{2}$ or 2 in. long. Calyx silky, a line deep, cut down nearly to the base, the teeth linear-lanceolate. Corolla purplish, scarcely exceeding the calyx. Pod sessile, oblong, mucronate, $\frac{1}{4}$ in. long, 1 line broad, thinly silky, 2- or 3-seeded.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Bidjem!*

29. **I. nigricans,** *Vahl; DC. Prod.* ii. 23? Stem suffruticose, a foot or more high, firm, erect, the branches spreading or erecto-patent, densely clothed with erecto-patent silvery pubescence with a tinge of brown. Stipules linear, spreading. Leaves of the main stem with 2–3 pairs of leaflets and a terminal one, of the branchlets 3-foliolate or simple, all obovate-oblong, $\frac{1}{4}$ in. long, the apex rounded and conspicuously mucronate, lateral ones opposite, short-stalked, texture firm, both sides grey-green, densely and permanently coated with adpressed silvery pubescence. Flowers solitary from the axils of the simple or the lower ones of the trifoliolate leaves, on slender spreading rigid bright-coloured pedicels half an inch long. Calyx $\frac{1}{8}$ in. deep, densely silky, the teeth reaching down nearly to the base, lanceolate acuminate or cuspidate, half a line broad. Corolla reddish, equalling the calyx. Ovary linear-oblong, densely silky. Pod unknown.

Upper Guinea. Banks of the Niger, *Dr. Baikie!*
A very distinct and well-marked plant.

30. **I. nigritana,** *Hook. f. Fl. Nigr.* 294. Stem 2–3 ft. high, herbaceous, erect, paniculately branched, the branches slender, glabrous, erecto-patent. Stipules minute, linear, deciduous. Leaflets 5–7, oblanceolate, the terminal one $\frac{3}{8}$–$\frac{1}{2}$ in. long by 2 lines broad, the apex rounded and mucronate, the lateral ones smaller, distant, opposite, the upper side subglabrous, the lower thinly silky. Flowers solitary, on filiform pedicels $\frac{1}{4}$–$\frac{3}{4}$ in. long from the axils of the simple leaves of the branches. Calyx 1 line deep, clothed with bright brown silky pubescence, the teeth lanceolate acuminate, reaching three-quarters of the way down. Corolla reddish, twice as long as the calyx, silky on the outside. Pod 2 lines long, 1 line broad, oblong mucronate, thinly silky, 2-seeded.

Upper Guinea. Banks of the Quorra, *Vogel!*

31. **I. sparsa,** *Baker.* Stem slender, erect, herbaceous, glabrous, a span high, copiously branched. Stipules minute setaceous. Petioles 1–2 lines long. Leaflets 3–7, oblanceolate, mucronate, the terminal one $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, the upper surface green and glabrescent, the lower glaucous and thinly silky. Flowers solitary or geminate on very slender axillary peduncles 6–9 lines long. Calyx $\frac{1}{2}$ line deep, with 5 equal linear teeth reaching down nearly to the base. Corolla reddish, $\frac{1}{8}$ in. deep. Pod linear, sessile, glabrous, 6–8-seeded.

Nile Land. Abyssinia, *Schimper!*

32. **I. sessiliflora,** *DC. Prod.* ii. 186. Stem a foot or more long, herbaceous, procumbent or suberect, copiously and diffusely branched from the base, the branches slender, wide-spreading, angular, moderately silvery. Stipules linear, often falcate. Petioles $\frac{1}{4}$–$\frac{3}{8}$ in. long, spreading. Leaflets 7–11, obovate, $\frac{1}{4}$ in. long, apex rounded mucronate, the lateral ones distant, opposite or alternate, sessile or the lowest short-stalked, both sides, especially the lower one grey-green and permanently silvery. Clusters dense, sessile, rounded, $\frac{1}{4}$ in. broad, about 12-flowered. Calyx subsessile, very silvery, a line deep, the teeth setaceous, reaching down nearly to the base. Corolla pale rose, not more than equalling the calyx. Pod sessile, linear, $\frac{1}{2}$ in. long, 1 line broad, mucronate, silky, slightly torulose, about 6-seeded.

Upper Guinea. Senegambia, *Perrottet* 183! *Heudelot!*
General habit of *I. enneaphylla*, but flowers in sessile clusters.

33. **I. trigonelloides,** *Jaub. et Spach. Illust.* t. 482. Stem 6–12 in. long, herbaceous, erect, copiously branched from the base, the branches erecto-patent, silvery throughout. Stipules lanceolate acuminate. Petioles $\frac{1}{2}$ in. long, erecto-patent. Leaflets 3–5, obovate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, apex rounded, mucronate, lateral ones sessile, distant, opposite, both sides glaucous, and rather thickly coated with adpressed silvery hairs. Clusters $\frac{1}{4}$ in. broad, dense, rounded, sessile, 12–20-flowered. Calyx $\frac{1}{8}$ in. deep, densely silvery, the teeth linear, reaching three-quarters of the way down. Corolla purplish, equalling the calyx. Pod sessile, linear-oblong, mucronate, very silky, $\frac{1}{4}$ in. long, 1 line broad, 2–3-seeded—*I. asperifolia*, Hochst. in Schimp. Hb. Abyss. No. 2272. *I. æruginis*, Schweinf. Fl. Æthiop. 11.

Nile Land. Abyssinia, *Schimper!*
General habit and texture of *I. sessiliflora*, but more loosely and copiously silvery; the leaflets fewer, and pod like that of *enneaphylla*. It has been gathered in Scinde by Dr. Stocks.

34. **I. arenaria,** *A. Rich. Fl. Abyss.* i. 183. Stems erect, herbaceous, only 2–3 in. high, densely branched from the base, with erecto-patent silky branches. Stipules small, linear. Leaves simple, or with one or even two pairs of leaflets, which are obovate, half an inch long by about half as broad, apex rounded, mucronate, both sides glaucous, and permanently but not densely argenteous. Flowers in subsessile abbreviated racemes of 2–6 each from the axils of the leaves. Calyx

densely silky, a line deep, the lower teeth linear, reaching half way down, the upper ones lanceolate, shorter. Corolla bright purple, twice as long as the calyx. Pod spreading, linear, mucronate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, a line broad, thinly silky, subterete, 6–8-seeded.

Nile Land. Nubia, *Schweinfurth!* Abyssinia, *Petit.*
Not the same as *I. arenaria*, E. Meyer, which is *I. alternans*, DC.

35. **I. concinna,** *Baker.* Stems herbaceous, 6–9 in. long, copiously and diffusely branched from the base, the branches very slender, angular, only thinly hairy upwards. Stipules setaceous. Petioles very short. Leaflets 9–11, oblanceolate, $\frac{1}{4}$ in. long, 1 line broad, mucronate, the lateral ones opposite, nearly sessile, both sides green, very slightly silky. Flowers in close nearly sessile axillary clusters of about 6 flowers each. Pedicels very short. Calyx $\frac{1}{2}$ line deep, silky, the teeth setaceous, reaching down nearly to the base. Corolla twice as long as the calyx. Young pod linear mucronate, very silky.

Mozamb. Distr. Zambesi land, *Dr. Kirk! Dr. Meller!*
We have no specimens that show the mature pod.

36. **I. grisea,** *Baker.* Stem erect, almost woody below, very copiously branched, the branches ascending, firm, subterete, chestnut brown, densely clothed with fine short spreading grey hairs, a few of which bear glands. Stipules minute, setaceous, spreading. Petioles very short. Leaflets usually 5, oblanceolate-cuneate, $\frac{1}{4}$ in. long, apex rounded, mucronate, lateral ones distant, opposite, subsessile, texture firm, both sides grey, and densely clothed with adpressed silvery hairs. Flowers solitary or 2–4 together in sessile clusters in the axils of the leaves. Calyx over a line deep, very hairy, the teeth setaceous, reaching down nearly to the base. Corolla scarlet, twice as long as the calyx. Pod oblong-mucronate, 2–$2\frac{1}{2}$ lines long, half as broad, subterete, persistently villose, 2–3-seeded.

Upper Guinea. Niger country, Abbeokuta, *Dr. Irving!* Nupe, *Barter!*
Most like *I. sessiliflora*, but more shrubby, with fewer flowers in a cluster, and a different pod.

37. **I. suaveolens,** *Jaub. et Spach. Illust. t.* 489. Stem a foot high, woody, erect, copiously branched, the branches erecto-patent, coated with silvery pubescence. Stipules minute, linear. Petioles $\frac{1}{4}$ in. long, spreading, slender, argenteous. Leaflets 3, rarely 5, obovate, $\frac{3}{8}$ in. long, apex rounded, often emarginate, lateral ones smaller, opposite, short-stalked, texture firm, both sides pale green, scarcely at all argenteous. Flowers solitary, or more usually in lax irregular clusters of 2–4 together on peduncles about $\frac{1}{4}$ in. long. Pedicels cernuous, generally longer than the calyx, which is 1 line deep, silvery, campanulate, cut down nearly to the base, the teeth subulate, unequal. Pod linear-mucronate, an inch long, a line thick, straight, spreading, subtetragonous, thinly silky, 6–12-seeded.—*I. sparsiflora,* Hochst. in Schimp. Hb. Abyss. No. 2288.

Nile Land. Abyssinia, *Schimper!*

38. **I. parvula,** *Delile in Caill. Voy.* 38, t. 3, fig. 1. Stem 6–9 in. long, suffruticose, trailing, copiously and diffusely branched from the base, the branches slender, firm, terete, thinly silky. Stipules large, scariose, ovate-acuminate, persistent, slightly adnate to the petiole. Petiole very short. Leaflets three, obovate, mucronate, $\frac{1}{8}$ in. long, end one short-stalked, lateral ones sessile, texture firm, both sides thinly silky. Flowers in lax clusters of 2–4 each on a peduncle about $\frac{1}{4}$ in. long. Calyx $\frac{1}{8}$ in. deep, thinly silky, the lower teeth lanceolate, not reaching more than half way down, the upper ones shorter. Corolla twice as long as the calyx. Pod spreading, linear, mucronate, $\frac{1}{2}$ in. long, 1 line thick, thinly silky, subterete, 5–6-seeded.

Nile Land. Abyssinia, *Schimper!* Nubia, *Caillaud.*

39. **I. geminata,** *Baker.* Stem firmly herbaceous, erect, 1–2 ft. high, copiously branched, the branches ascending, firm, angular, only thinly silky upwards. Stipules setaceous. Petioles erecto-patent, $\frac{1}{8}$–$\frac{1}{4}$ in. long. Leaflets 3–5, oblanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $1\frac{1}{2}$–2 lines broad, the apex rounded and mucronate, terminal one close to the top pair, upper surface pale green, glabrous when mature, lower glaucous, and thinly clothed with strong adpressed grey hairs. Flowers usually in pairs, sometimes solitary on slender glabrous rigid filiform reddish-brown peduncles $\frac{1}{2}$ in. long from the axils of the leaves. Calyx under a line deep, thinly silky, the teeth linear, reaching three-quarters of the way. Corolla pale red. Pod linear, mucronate, glabrous, subtetragonous, 3–4 lines long, 1 line broad, about 4-seeded.

Upper Guinea. Banks of the Niger at Nupe, and of the Quorra at Jeba, *Barter!*
Most like *I. nigritana* in general habit, differing in its geminate flowers and more numerous seeds.

40. **I. vicioides,** *Jaub. et Spach. Illust.* t. 481. Stem herbaceous, 6–12 in. long, copiously and diffusely branched from the base, the branches slender, angular, thinly pilose. Stipules linear, minute. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long, erecto-patent. Leaflets 7–9, oblanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, $1\frac{1}{2}$–2 lines broad, mucronate, the lateral ones distant and short-stalked, both sides glaucous-green and thinly silky. Flowers in lax racemes of 3–6 flowers each on peduncles $\frac{3}{4}$–1 in. long from the axils of the leaves. Pedicels equalling the campanulate calyx, which is a line deep, thinly silky, the teeth setaceous reaching down nearly to the base. Corolla pale, twice as long as the calyx. Pod linear-mucronate, $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, straight, subcompressed, slightly torulose, permanently pilose, 5–6-seeded. — *I. agowensis,* Hochst. in Schimp. Hb. Abyss. No. 2243. *I. tenuicaulis,* Klotzsch in Peters' Mossamb. Bot. 50.

Nile Land. Abyssinia, *Schimper!*
South Central. Highlands of Batoka country, *Dr. Kirk!* Mozambique, *Peters!*

41. **I. viscosa,** *Lam.; DC. Prod.* ii. 227. Stems 1–4 ft. high, herbaceous, diffusely branched from the base, the branches more or

less densely coated with stalked glands. Stipules linear. Petioles $\frac{1}{2}$–1 in. long, erecto-patent. Leaflets 7–13, oblanceolate or obovate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, the apex rounded and mucronate, the lateral ones distant, opposite, subsessile, both sides glaucous, thinly silvery. Flowers in lax racemes of 4–6 each on axillary peduncles $\frac{1}{2}$–1 in. long. Pedicels very short. Calyx a line deep, not silvery, the teeth setaceous, reaching down nearly to the base. Corolla reddish, twice as long as the calyx. Pod linear, mucronate, $\frac{1}{2}$–1 in. long, 1 line broad, subterete, slightly torulose, glandular, 10–12-seeded.—*I. glutinosa*, Perrott. DC. Prod. l.c. non Vahl. *I. lateritia*, Willd. Sp. Pl. 3. 1233.; DC. Prod. l.c. *I. consanguinea*, Klotzsch in Peters' Mossamb. Bot. 50.

Upper Guinea. Senegambia, *Perrottet!* Niger country, *Barter!*
Nile Land. Nubia, *Kotschy!* Abyssinia, *Schimper!*
Mozamb. Distr. Zanzibar, *Bojer!* Quillimane, *Peters!*
A common East Indian species, extending eastward to Queensland.

42. **I. pilosa,** *Vahl; DC. Prod.* ii. 223. Annual or biennial, 1–2 ft. long, copiously and diffusely branched from the base, the branches slender, angular, densely clothed with strong erecto-patent silky hairs. Stipules linear, 3–4 lines. Petioles very short. Leaflets 3, the terminal one oblong or obovate, blunt, mucronate, $\frac{3}{4}$–$\frac{7}{8}$ in. long, the lateral ones at a distance from it, smaller and often unequal or only one or neither developed, both sides grey-green, the lower one very pale, both densely clothed with strong adpressed grey hairs. Flowers solitary or in lax racemes of 2–4 on erecto-patent peduncles 1–$1\frac{1}{2}$ in. long from the axils of the leaves. Calyx hairy, a line deep, the teeth setaceous, reaching down nearly to the base. Corolla rose-red, slightly exceeding the calyx. Pod linear, mucronate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, a line broad, subterete, pilose, 10–12-seeded, black when mature.—*Hemispadon pilosus*, Endl. in Flora, 1832, ii. 385, t. 1.; Atakta, t. 3. Walp. Rep. i. 660. *I. guineensis*, Schum. et Thonn. Pl. Guin. 141.

Upper Guinea. Guinea proper, *Thonning. Barter!* Senegambia, *Perrottet!*
Lower Guinea. Loanda, *Dr. Welwitsch!*

43. **I. pentaphylla,** *Linn.; DC. Prod.* ii. 230. Stems a foot or more high, herbaceous or slightly fruticose, copiously and diffusely branched, the branches slender, subglabrous. Stipules small, linear. Petioles $\frac{1}{4}$ in. long. Leaflets 5–7, oblanceolate or obovate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, the apex rounded and mucronate, the lateral ones opposite and short-stalked, upper surface green, subglabrous, lower glaucous, thinly silvery. Flowers in lax racemes of 2–5 each on peduncles $\frac{1}{2}$–1 in. long from the axils of the leaves. Bracts setaceous, equalling the pedicels. Calyx a line deep, thinly silky, cut down nearly to the base, the teeth setaceous. Corolla reddish, at least twice as long as the calyx. Pod linear, mucronate, $\frac{3}{4}$–1 in. long, a line broad, straight, glabrous when mature, subtetragonous, 10–12-seeded.—*I. glabra*, Linn. Suppl. 1062. *I. fragrans*, Retz. Obs. iv. 29; *I. viscosa*, var. *subglabra*, A. Rich. Fl. Abyss. i. 182.

Upper Guinea. Sierra Leone, *Afzelius!* (pod and flowers smaller; perhaps distinct).

Nile Land. Abyssinia, *Schimper! Quartin-Dillon!* Madi woods, *Speke and Grant!*

Mozamb. Distr. Mozambique, *Speke!* Zambesi land, *Meller! Kirk!* Zanzibar, *Dr. Kirk!*

A common East Indian species. *I. pentaphylla*, Burch., Harv. Fl. Cap. ii. 178, is a different plant, belonging to a group with five or more leaflets digitately arranged, of which we have no representatives within our limits, and of course it will have to receive a new name.

44. **I. multijuga,** *Baker.* Stem slender, herbaceous, erect, the branches weak, erecto-patent, angular, subglabrous. Stipules small, linear. Petioles very short. Leaflets 13–17, oblanceolate or narrowly oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long, $1\frac{1}{2}$–2 lines broad, apex rounded conspicuously mucronate, lateral ones on short stalks, the lowest pair shorter and broader than the others, upper surface green subglabrous lower glaucous and thinly silvery. Flowers in lax racemes of 4–6 each from the axils of the leaves on slender glabrous peduncles $1\frac{1}{2}$–2 in. long. Bracts setaceous, equalling the pedicels. Calyx a line deep, subglabrous, the teeth setaceous, reaching down nearly to the base. Corolla reddish, three times as long as the calyx. Pod 1 in. long, 1 line thick, linear, mucronate, straight, dark brown, glabrous, subtetragonous, about 10-seeded.

Mozamb. Distr. *Zambesi land, Dr. Kirk!*

Very near *I. pentaphylla*, from which it differs principally by its more numerous leaflets.

45. **I. parviflora,** *Heyne in Wight et Arn. Prod. Fl. Ind. Or.* 201. Stem herbaceous, 1–2 ft. long, erect, diffusely branched, the branches angular, sulcate, thinly silky. Stipules minute, setaceous. Petioles $\frac{1}{4}$ in. long. Leaflets 5–7, narrowly oblanceolate, $\frac{1}{2}$–1 in. long, 1–$1\frac{1}{2}$ lines broad, the lateral ones distant, short-stalked, the point rounded and mucronate, both sides pale-green and thinly silvery. Flowers in sessile or subsessile abbreviated racemes of 6–12 flowers each from the axils of the leaves. Calyx silvery, $\frac{1}{8}$ in. deep, the teeth linear, reaching more than halfway down, the lowest the longest. Corolla pale lilac, twice as long as the calyx. Pods linear-mucronate, deflexed, slightly recurved towards the point, 1–$1\frac{1}{2}$ in. long, 1 line broad, subterete, rather densely silvery when young, 15–20-seeded.—Benth. Fl. Austr. ii. 197. *I. linearis*, Guill. et Perr. Fl. Seneg. 184. *I. deflexa*, Hochst. in Kotsch. Hb. Nub. 14. A. Rich. Fl. Abyss. i. 178. *I. macrocarpa*, Fenzl in Kotsch. Pl. Kord. 118. *Indigastrum deflexum*, Jaub. et Spach, Illust. Pl. Or. t. 492.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*

Nile Land. Nubia and Kordofan, *Kotschy. Cienkowsky!* Abyssinia, *Schimper! Quartin-Dillon.*

Ranges from the Cape Verdes through Tropical Asia to North Australia.

46. **I. stenophylla,** *Guill. et Perr. Fl. Seneg.* 188, t. 48. Stem 1–3 ft. high, erect, herbaceous, sparingly branched, subglabrous below,

thinly silky upwards. Stipules setaceous. Petioles erecto-patent, ½–1 in. long. Leaflets 11–13, linear, narrowed to both ends, 1–1½ in. long, 1–1½ lines broad, the lateral ones opposite, sessile, ½–¾ in. apart, both sides with short adpressed grey hairs. Flowers in nearly sessile lax axillary racemes 2–3 in. long. Pedicels very short, erecto-patent. Calyx thinly silky, more than 2 lines deep, teeth setaceous, reaching down nearly to the base, lowest the longest. Corolla rose-coloured, half as long again as the calyx. Pod linear-mucronate, 1½–2 in. long, ⅛ in. broad, erecto-patent, slightly upcurved, thinly silky, 12–15-seeded.—A. Rich. Fl. Abyss. i. 179. β. *I. brachypoda*, (Steud. in Schimp. Hb. Abyss. No. 1711) leaflets oblanceolate, 2 to 3 lines broad, racemes reduced to half-an-inch long and under a dozen flowers.

Upper Guinea. Senegambia, *Perrottet! Heudelot!* Banks of the Niger, *Barter!*
North Central. Udgé, *E. Vogel!*
Nile Land. Nubia, Banks of the White Nile, *Petherick!* Abyssinia, *Schimper! Quartin-Dillon!* Madi, *Speke and Grant!*

47. **I. Prieureana**, *Guill. et Perr. Fl. Seneg.* 187. Stem herbaceous, 12–18 in. high, erect, sparingly branched, subglabrous. Stipules linear-subulate, ¼ in. long. Petioles erecto-patent, ¼–½ in. long. Leaflets 19-21, oblanceolate, ½–¾ in. long, 2 to 3 lines broad, the apex rounded and mucronate, the lateral ones opposite, ¼–⅜ in. apart, both sides thinly silky. Flowers in nearly sessile lax axillary racemes which ultimately about equal the leaves. Calyx 1½–2 lines long, very silky, the teeth setaceous, reaching down nearly to the base, the lowest much the longest. Corolla rose-coloured, slightly exceeding the calyx. Pod linear-mucronate, 1–1¼ in. long, ⅛ in. broad, erecto-patent, subtetragonous, thinly silky, 12–15-seeded.

Upper Guinea. Senegambia, *Heudelot! Perrottet!*

48. **I. Welwitschii,** *Baker*. A diffuse copiously branched annual with very slender subglabrous stems reaching a foot long. Stipules 1–2 lines, setaceous persistent. Petioles 2–3 lines. Leaflets 3, coriaceous, linear, pale green, narrowed gradually to an acute point, both sides with a few inconspicuous adpressed grey bristles, the terminal one short-stalked, 6–9 lines long, under a line broad, the side ones opposite, leaflets of a few of the primordial leaves oblong. Flowers 4–9 in very lax short-stalked often subsecund racemes 1–2 in. long. Bracts minute setaceous. Pedicels 1–1½ lines rigidly patent or deflexed. Calyx 1 line long, densely grey-hispid, the linear-setaceous teeth exceeding the tube. Corolla bright red, twice the calyx, the standard glabrous on the outside. Pod linear, 8–9 lines long, ½ line broad, much upcurved, grey, glabrescent, 12–15-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*
Habit of the Cape *I. filipes*, Benth., which has 3–4-jugate leaflets.

49. **I. psilostachya,** *Welw. mss.* A moderately-branched erect annual, 2–4 ft. high, with erecto-patent slender angular branches with a few

adpressed grey bristles. Stipules linear-setaceous, $\frac{1}{4}$ in. Petioles $\frac{1}{8}$–$\frac{1}{4}$ in. Leaves $2\frac{1}{2}$–3 in.; leaflets 5–7, oblanceolate, both sides pale-green with a few adpressed grey bristles, reaching 1–2 in. long, the upper leaves 3–4, the lowest 5–6 lines broad, blunt with a distinct mucro, the end one short-stalked, the side ones lax opposite distinctly stalked. Flowers 20–50 in lax racemes ultimately 9–12 in. long on erecto-patent peduncles as long as the leaves. Pedicels very short. Bracts minute, setaceous, deciduous. Calyx $\frac{1}{8}$ in., thinly grey-silky, the linear teeth much exceeding the tube. Corolla bright violet, 5 lines, the standard thinly grey-hispid externally. Pod linear, 1 in. long, 1 line broad, quite straight, thinly coated with adpressed grey bristles, 10–12-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

50. **I. Heudelotii,** *Benth. in Herb. Kew.* Stem erect, herbaceous, 12–18 in. high, copiously branched, the branches slender, angular, thinly pilose. Stipules linear, deciduous. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long, erecto-patent. Leaflets 7–13, oblanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 2 lines broad, conspicuously mucronate, lateral ones distant and short-stalked, both sides grey-green and thinly pilose, not at all silvery. Flowers 6–12 in lax racemes on erecto-patent pilose peduncles $\frac{3}{4}$–1 in. long from the axils of the leaves. Pedicels 1–$1\frac{1}{2}$ lines long. Calyx campanulate, not silvery, 1 line deep, the teeth setaceous, reaching down nearly to the base. Corolla more than twice as long as the calyx. Pod $\frac{1}{2}$–$\frac{5}{8}$ in. long, 1 line broad, chestnut-brown, glabrous, subtetragonous, 5–6-seeded.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Morson!*

51. **I. goniodes,** *Hochst. in Schimp. Hb. Abyss.* No. 2242. Stem 1–3 ft. high, erect, herbaceous, copiously branched, the branches ascending, angular, sulcate, thinly silvery. Stipules linear. Petioles very short. Leaflets 11–13, oblanceolate, $\frac{1}{2}$–1 in. long, 2–4 lines broad, apex rounded, mucronate, both sides pale-green and thinly silvery. Flowers in lax racemes 2–4 in. long of from 20–30 flowers, on erecto-patent peduncles 2–3 in. long from the axils of the leaves. Flowers cernuous, finally deflexed. Calyx nearly 2 lines deep, thinly silvery, the teeth linear, reaching halfway down. Corolla twice as long as the calyx, pale lilac. Pod deflexed, linear, mucronate, 1–$1\frac{1}{2}$ in. long, $\frac{1}{8}$ in. thick, finely silvery, slightly upcurved, 12–15-seeded.

Nile Land. Abyssinia, *Schimper!*

52. **I. crotalarioides,** *Baker.* Stem slightly shrubby, copiously and diffusely branched, the young branches slender, angular, thinly-silvery. Stipules a line long, linear, spreading. Leaves subsessile, pinnately trifoliolate, central leaflet oblanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $1\frac{1}{2}$–2 lines broad, apex rounded, mucronate, its petiolule $\frac{1}{8}$ in. long, the lateral ones smaller, upper side green and thinly silky, the lower quite argenteous. Flowers in axillary racemes of 8–12 flowers, at first dense, afterwards

elongated on slender peduncles 2–3 in. long. Bracts linear-lanceolate, argenteous, equalling the pedicels which are about half a line long. Calyx tubular, argenteous, $\frac{3}{4}$ line deep, the teeth lanceolate-deltoid, reaching nearly halfway down. Corolla purplish, four times as long as the calyx. Pods deflexed, an inch long, $\frac{1}{8}$ in. thick, linear, mucronate, argenteous, 6–9-seeded.—*Tephrosia crotalarioides*, Klotzsch in Peters' Mossamb. Bot. 45.

Mozamb. Distr. Zambesi land, *Peters!*

Very like *I. trita*, from which it may be known by its calyx and subsessile leaves.

53. **I. medicaginea,** *Welw. mss.* Annual or biennial with slender prostrate stems a foot or more long, several times forked with a few adpressed grey bristles upwards. Stipules setaceous, very minute. Petioles 3–4 lines. Leaflets 3 (often 1 in the annual form) green with a few adpressed grey bristles on both sides, the central one 6–8 lines long, roundish or broad-obovate, blunt with a faint mucro, distinctly stalked, the side ones smaller opposite. Racemes 6–20-flowered, 9–18 lines long on very slender peduncles 6–12 lines long. Lower pedicels 3–4 lines long patent or erecto-patent. Calyx $\frac{1}{2}$ line long, thinly hispid, the lanceolate teeth as long as the tube. Corolla bright red, $\frac{1}{2}$ in. long, the standard $\frac{1}{8}$ in. broad, glabrous externally. Pod linear, $\frac{1}{2}$ in. long, densely grey-pubescent, upcurved, 8–9-seeded.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

54. **I. oxalidea,** *Welw. mss.* A trailing perennial herb with copiously branched stems a foot or more long, the slender flexuose branches inconspicuously grey-hispid. Stipules a line long, setaceous, persistent. Petiole shorter than the stipules. Leaflets 3–5, obovate-oblong, firm, bright green and subglabrous above, glaucous and inconspicuously grey-hispid beneath, blunt with a faint mucro, 4–6 lines long, the terminal one stalked, the side ones alternate. Racemes laxly 6–20-flowered on peduncles 3–6 lines long, finally 12–18 lines long. Pedicels very short, the lower cernuous. Calyx $\frac{1}{8}$ in. deep, thinly grey-hispid, the linear-setaceous teeth reaching down nearly to the base. Corolla purplish-red, half as long again as the calyx, the standard $\frac{1}{8}$ in. broad, grey-silky externally. Pod deflexed, linear, $\frac{1}{4}$–$\frac{3}{8}$ in. long, 1 line broad, glabrescent, nearly straight, tipped with a persistent style a line long, 3–4-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

55. **I. trita,** *Linn. f.*; *DC. Prod.* ii. 232. Annual or biennial with firm copiously branched ascending stems, slightly shrubby downwards, densely clothed upwards with adpressed grey bristles. Stipules setaceous, persistent, $1\frac{1}{2}$–2 lines. Petioles 6–9 lines. Leaflets 3, very rarely 5, oblong or ovate or obovate-oblong, blunt with a faint mucro, green and scabrous above, glaucous and densely clothed with brittle grey bristles below, the central one 6–12 lines long, distinctly stalked, the side ones usually opposite. Flowers in copious short-peduncled

moderately dense racemes 2–6 in. long. Pedicels very short, the lower deflexed. Calyx $\frac{3}{4}$–1 line, the setaceous teeth reaching down nearly to the base. Corolla purplish-red, twice the calyx, silky externally. Pods deflexed, an inch long, 1 line thick, brown, glabrescent, slightly upcurved, 8–10-seeded.—*I. hedysaroides*, Lam. Encycl. iii. 250. *I. cinerea*, *arcuata* and *rigida*, Willd. Sp. Pl. iii. 1225–8.

Lower Guinea. Pungo Andongo, Golungo Alto, Loanda and Ambaca, *Dr. Welwitsch!*

Nile Land. Abyssinia, *Roth!*

A common East India species, extending to North Australia.

56. **I. subulata,** *Vahl; DC. Prod.* ii. 232. Annual or biennial, 2–3 ft. high, copiously branched, the branches firm, slender, thinly silky. Stipules minute, setaceous. Petioles $\frac{1}{2}$–$\frac{3}{4}$ in. long. Leaves with usually two lateral pairs of leaflets and a terminal one, which are elliptical, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, the apex rounded and mucronate, bright green, the lateral ones opposite, nearly sessile, both sides subglabrous. Flowers in lax racemes of about 20 flowers each on erecto-patent peduncles 1–2 in. long from the axils of the leaves. Calyx a line deep, thinly silky, the teeth setaceous, reaching down nearly to the base. Corolla lilac, three times as long as the calyx. Pod linear, mucronate, deflexed, subtetragonous, subglabrous, 1–2 in. long, 1 line broad, 8–10-seeded.—*I. Thonningii*, Schum. et Thonn. Pl. Guin. 366. *I. flaccida*, Koen.; Roxb. Fl. Ind. iii. 375. *I. scabra*, Roth. Nov. Sp. 359; DC. Prod. ii. 229.

Upper Guinea. Guinea Proper, *Thonning*. Senegambia, *Leprieur and Perrottet.*

Also a plant of the East and West Indies and Mexico.

57. **I. benguellensis,** *Baker.* An argenteous trailing perennial herb with slender terete stems more than a foot long, with copious ascending curved branches. Stipules minute, linear, persistent. Petioles 2–3 lines. Leaves 9–12 lines long; leaflets 3–5, narrow-obovate, reaching 6–8 lines long, 3–$3\frac{1}{2}$ lines broad, blunt, often emarginate, thick in texture, both sides persistently argenteo-canescent, the end one shortly-stalked, the side ones alternate. Racemes densely 12–20-flowered, 9–15 lines long, on short peduncles. Pedicels very short. Bracts linear, minute, persistent. Calyx argenteous, $\frac{1}{8}$ in. long, the linear-lanceolate teeth exceeding the obliquely campanulate tube. Corolla bright violet, half as long again as the calyx, the standard thinly silvery on the back. Pod linear, 6–8 lines long, $\frac{1}{8}$ in. broad, straight, canescent, subcompressed, 5–6-seeded.

Lower Guinea. Mossamedes, in sands near the sea, *Dr. Welwitsch!*

58. **I. inhambanensis,** *Klotzsch in Peters' Mossamb. Bot.* 48. A woody copiously branched shrub more than a foot high with long, firm, ascending terete densely grey-silky branches. Petiole $\frac{1}{2}$ in. long, densely grey-silky. Leaves pinnately trifoliolate, terminal leaflet on a stalk $\frac{1}{4}$ in. long, elliptical, $\frac{1}{2}$–$\frac{3}{4}$ in. long by about half as broad, lateral

ones opposite, similar but smaller, texture firm, both sides densely grey-silky. Flowers in dense copious erecto-patent bracteate axillary racemes under an inch long. Pedicels very short. Calyx $\frac{1}{8}$ in. long, grey-silky, cut down nearly to the base, the teeth linear-subulate, about equalling the corolla. Pod linear, 3–4 lines long, under 1 line thick, densely grey-silky, 3–4-seeded.

Mozamb. Distr. Sofala, Inhambane, *Dr. Peters!*

In general habit and the shape and texture of its leaves resembling *I. paucifolia*, but quite different in calyx and pod.

59. **I. paucifolia,** *Delile ; DC. Prod.* ii. 224. A suberect shrub 4–8 ft. high, with slender, terete, flexuose, argenteous canescent branches. Stipules minute, linear-subulate, deciduous. Petioles 3–4 lines, argenteous. Leaflets 3–5, obovate-oblong, the terminal one 6–9 lines long, blunt with a mucro, the lateral ones laxly placed, usually alternate, both sides grey-green, and especially the under one argenteous. Racemes short-stalked, 20-40-flowered, usually exceeding their leaves. Pedicel and calyx 1 line, both argenteous, the lower teeth of the latter lanceolate, as long as the tube. Corolla scarlet, twice the calyx, argenteous externally. Pod 6–9 lines long, 1 line broad, linear, slightly upcurved and torulose, glaucous, 6–8-seeded.—*I. erythrantha*, Hochst. in Schimp. Hb. Abyss. No. 2178.

Upper Guinea. Senegambia, *Perrottet! Leprieur! Heudelot!*
North Central. Kouka, near Lake Tschad, *E. Vogel!*
Nile Land. Nubia and Abyssinia, frequent, *Sieber! Schimper! Speke and Grant!* &c.
Lower Guinea. Benguella, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Also Egyptian, Arabian, and East Indian.

60. **I. hirsuta,** *L. ; DC. Prod.* ii. 228. An erect or decumbent moderately branched annual or biennial, reaching 2–3 ft. high, with stems densely clothed with long fine spreading brown pubescence. Stipules setaceous, 3–4 lines, plumose. Leaves $1\frac{1}{2}$–3 in. ; leaflets usually 5–7, rarely 9, obovate, 9–15 lines long, blunt with a faint mucro, grey and thinly silky above, more densely silky beneath, the midrib brown, all distinctly petiolulate, the side ones always opposite. Racemes moderately dense, 2–5 inches long, on erecto-patent peduncles shorter than the leaves. Bracts setaceous, brown-plumose. Pedicels $\frac{1}{2}$ line long, cernuous. Calyx $\frac{1}{8}$ in. long, densely brown-silky, the setaceous teeth reaching down nearly to the base. Corolla scarlet, half as long again as the calyx. Pod linear, straight, 6–9 lines long, 1 line broad, densely clothed with spreading grey or brown pubescence, 6–8-seeded.—Jacq. Ic. t. 569. Beauvois Fl. d'Oware, t. 119. Hook. Comp. Bot. Mag., t. 24. *I. ferruginea*, Schum. et Thonn. Pl. Guin. 370. *I. fusca*, G. Don, Gard. Dict. ii. 211.

Upper Guinea. Senegambia, *Perrottet! Heudelot!* Guinea Proper *Beauvois, Thonning, Vogel!* and others. Island of St. Thomas, *G. Don!*
North Central. Bornu, *E. Vogel!*
Nile Land. White Nile, *Petherick!* Unyoro and Mininga, *Speke and Grant!*

Lower Guinea. Common in Angola, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Kirk!*
Reaches the Cape, Madagascar, and through Tropical Asia to North Australia, and is introduced in Brazil.

Var. β. *polystachya*, Welw. mss. Leaves closer; leaflets more numerous, lateral 5–6-jugate; racemes shorter, denser, a large number from the upper leaves overtopping the stem.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

Var. *pumila*, Welw. mss. Dwarf (foot high), perennial, suffruticose, copiously branched; leaflets 7–9, rotundate-obovate, 3–4 lines long; racemes dense, at first 1, finally 2 in. long: flowers smaller.
Lower Guinea. Huilla, Benguela, 5000 feet, *Dr. Welwitsch!*

61. **I. astragalina,** *DC. Prod.* ii. 228. An erect, moderately branched annual, 1–2 ft. high, with stems densely clothed with spreading whitish hairs. Stipules setaceous, 3–4 lines. Leaves 1–3 in. long; leaflets 7–11, obovate, reaching 6–9 lines long, blunt, faintly mucronate, both sides persistently clothed with spreading white soft hairs, the end one distinctly stalked, the side ones opposite. Racemes dense, 1–2, finally 3–4 in. long on peduncles 1–3 in. long. Bracts setaceous. Calyx $\frac{1}{8}$ in. long, densely white-pubescent, the setaceous teeth reaching down nearly to the base. Corolla bright yellow, half as long again as the calyx. Pod 5–6 lines long, 1 line broad, persistently grey-pubescent, 4–5-seeded.

Upper Guinea. Senegambia, *Heudelot! Perrottet!* Niger country, *Barter!*
Nile Land. Kordofan, *Kotschy!*
Lower Guinea. Benguela, *Dr. Welwitsch!*

62. **I. alternans,** *DC. Prod.* ii. 229. A prostrate, more or less argenteo-canescent herb, copiously branched at the crown of the root and upwards with stems a foot or less long. Stipules linear, very minute. Petioles 3–4 lines long. Leaves 9–12 lines long; leaflets 7–9, obovate-oblong, 4–6 lines long, blunt, often emarginate, both sides persistently argenteo-canescent, all distinctly stalked, the side ones alternate. Flowers 12-20 in dense racemes about an inch long, on peduncles which often exceed the leaves. Pedicels $\frac{1}{2}$ line long. Calyx $\frac{1}{8}$ in. long, densely grey-hispid, the setaceous teeth reaching down nearly to the base. Corolla bright violet, half as long again as the calyx, the round standard $2\frac{1}{2}$ lines broad, glabrous externally. Pods deflexed, linear, 5–6 lines long, $\frac{1}{8}$ in. thick, persistently canescent, 5–6-seeded.—Harv. Fl. Cap. ii. 199. *I. hololeuca*, Benth.; Harv. Fl. Cap. loc. cit.

Lower Guinea. Mossamedes, Benguela, in sandy desert plains, *Dr. Welwitsch!*

Var. β. *macra*, Baker. Suberect, 1–2 ft. long, copiously branched, less argenteous, much more robust; leaflets oblanceolate, 8–9 lines long, 2–4 lines broad; lower racemes reaching 6–9 lines long.

Lower Guinea. Mossamedes, Benguela, in sands of the seashore, *Dr. Welwitsch!*

63. **I. maritima,** *Baker.* A diffuse copiously branched prostrate perennial herb, with very flexuose stems 1–2 feet long, densely clothed

with short spreading white pubescence. Stipules linear, 1–2 lines, spreading, persistent. Petioles 3–4 lines. Leaves 12–18 lines; leaflets 5–9, obovate-oblong, distinctly emarginate, 4–6 lines long, all distinctly stalked, side ones alternate. Racemes densely 20–30-flowered, at first conical, 1 in., finally 2–3 in. long, on peduncles that frequently exceed the leaves. Pedicels very short. Calyx 2 lines long, densely white-pubescent like the rest of the plant, the plumose setaceous teeth reaching down nearly to the base. Corolla bright violet, half as long again as the calyx, the standard finely pubescent on the back. Pod linear, straight, 6–9 lines long, $\frac{1}{8}$ in. thick, finely grey-downy, 8–10-seeded.

Lower Guinea. Mossamedes, Benguela, frequent on the sands of the seashore, *Dr. Welwitsch!* who very justly compares the vestiture to that of *Medicago marina.*

64. **I. heterocarpa,** *Welw. mss.* A herbaceous perennial very copiously branched at the crown of the root and upwards with very slender branches, thinly coated with adpressed grey bristles. Stipules 1–$1\frac{1}{2}$ lines, setaceous, persistent. Petioles 1–2 lines. Leaves 6–9 lines long; leaflets 5–7, oblanceolate, pale green, with a few adpressed grey bristles on both sides, $\frac{3}{8}$–$\frac{1}{2}$ in. long, subacute, cuspidate, the end ones distinctly stalked, the side ones subsessile, opposite. Flowers 6–12 in copious lax racemes 12–18 lines long, on peduncles about as long as the leaves. Pedicels $\frac{1}{2}$ line. Calyx 1 line, densely grey-hispid, teeth linear-setaceous down nearly to the base. Corolla purplish-red, under twice the calyx, the standard slightly grey-silky on the outside. Pod 3–4 lines, $\frac{3}{4}$ line thick, terete, finely grey-hispid, straight, 4–5- sometimes 1–2-seeded.

Lower Guinea. Huilla, Benguela, in high pastures 5400 feet above sea-level, *Dr. Welwitsch!*

65. **I. setiflora,** *Baker.* An erect copiously branched herbaceous perennial 1–2 ft. high, with slender finely grey-hispid branches. Stipules setaceous, ciliated, very minute. Petioles 2–3 lines. Leaves 12–18 lines long; leaflets 5–7, oblanceolate, 6–8 lines long, bluntish with a distinct mucro, grey and thinly hispid above, glaucous and more densely so below, the end one distinctly stalked, the side ones opposite. Flowers in racemes 2–3 in. long, dense upwards, lax after they expand, on peduncles an inch long. Pedicels very short. Calyx $\frac{1}{8}$ in., teeth setaceous, reaching down to the base, densely plumose with blackish-grey bristles. Corolla purple, scarcely exceeding the calyx, the standard thinly hispid externally. Ovary oblong, densely grey-hispid, pauciovulate. **Pod not seen.**

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*
Between *I. secundiflora* and the Natal *I. grata,* E. Meyer.

66. **I. mimosoides,** *Baker.* A herbaceous perennial, with copiously divaricately branched very slender stems, a foot long, thinly clothed with short grey bristles. Stipules minute, setaceous, persistent. Petioles 2–3 lines. Leaves 9–12 lines long; leaflets 3–7, oblong, 3–4

lines long, blunt with a distinct mucro, green above, glaucous beneath, both sides scabrous with short adpressed grey bristles, all distinctly stalked, the side ones opposite. Flowers 6–10, in very lax distinctly peduncled erecto-patent racemes 1–1½ in. long, some of the bristles of the rachis gland-tipped. Pedicels ½ line. Calyx 1 line, densely grey-bristly, the spreading setaceous teeth exceeding the campanulate tube. Corolla violet, nearly twice the calyx, the standard thinly grey-bristly on the outside. Pod linear, 6–7 lines long, finely grey-hispid, many of the bristles gland-tipped, 8–10-seeded.

Lower Guinea. Highlands of Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

67. **I. torulosa,** *Baker.* A copiously branched shrub with slender firm terete glabrous branches. Stipules setaceous. Petioles slender, firm, erecto-patent, glabrous, ½ in. long. Leaflets 5–9, the terminal one considerably larger than the others, sometimes more than 2 in. long by half as broad, ovate or oblong, rounded at both ends, the apex mucronate, the lateral ones opposite, distinctly stalked, upper surface green, lower glaucous, the hairs on both very thin and short, scarcely visible in the mature plant without a lens. Flowers in sessile slender racemes 2 in. long. Bracts linear, deciduous. Calyx obliquely campanulate, half a line deep, subglabrous, the teeth shallow, deltoid. Corolla 4–6 times as long as the calyx, probably yellow when fresh, but turning to dark brown when dried. Pods deflexed, linear, mucronate, slender, glabrous, nearly straight, 1½–2 in. long, very distinctly torulose, 4–8-seeded.

Mozamb. Distr. Zambesi land, between Tette and Lupata, and banks of the Rovuma river, *Dr. Kirk!*

68. **I. subcorymbosa,** *Baker.* A copiously branched shrub 2–4 ft. high, the very slender branchlets thinly coated with short grey pubescence. Stipules minute setaceous. Petioles 2–3 lines. Leaves 18–21 lines long. Leaflets 5–7, obovate, blunt with a minute mucro, 6–9 lines long, both sides with a few adpressed grey bristles, all distinctly stalked, the side ones opposite. Flowers 6–12 in close abbreviated short-stalked racemes shorter than the leaves. Pedicels ½ line, densely brown-silky. Calyx ½ line, densely brown-silky, the linear-lanceolate teeth equalling the tube. Corolla 2 lines long, scarlet, turning brick-red, the oblong standard subglabrous externally. Ovary linear, subglabrous, multiovulate. Pod not seen.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

69. **I. Binderi,** *Kotschy Pl. Binder.* xv. t. 6 B. Stem suffruticose, erect, the whole plant scabrous with short rough hairs, the branches angular and striated. Stipules ¼ in. long, rigid, subulate. Petiole ¼ in. long. Leaflets 3–7, obovate, ½–⅝ in. long, the apex emarginate and mucronate, both sides, especially the under one, scabrous, the lateral ones opposite and distinctly stalked. Flowers in moderately

dense racemes of about 20 each, about 2 in. long on erecto-patent axillary peduncles which equal them. Bracts linear, about 2 lines long. Calyx nearly sessile, a line long, densely clothed with short hairs, the mouth oblique, the teeth subdeltoid. Corolla scarcely twice the calyx, hairy on the outside, the standard and keel roundish and convex, the wings much smaller. Ovary linear-oblong, with 8 ovules. Pod not known.

Nile Land. Banks of the White Nile, *Binder.*

70. **I. rhynchocarpa,** *Welw. mss.* An undershrub 3–4 ft. high with strong terete grey glabrous woody branches. Stipules setaceous, $1\frac{1}{2}$–2 lines. Petioles 12–15 lines long. Leaves 5–6 in. long. Leaflets 7, rarely 9, subcoriaceous, both sides glabrous, upper dull green, lower glaucous, oblong or with a slight obovate tendency, blunt with a faint deciduous mucro, reaching $2\frac{1}{2}$–3 in. long, 18–21 lines broad, the end one distinctly stalked, the side ones opposite, shortly stalked, all stipellate. Racemes dense, comose in bud with deciduous setaceous bracts $\frac{1}{4}$ in. long, 2–4 in. long in flower, casually forked. Pedicels $\frac{1}{2}$–1 line glabrous. Calyx 1 line deep, glabrous, coriaceous; teeth very short deltoid. Corolla 5–6 lines long, whitish tinged with red, the standard glabrous and tinged with green on the outside. Pod coriaceous, $2\frac{1}{4}$–$2\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad, terete, black, glabrous, upcurved at the very point, where it is curiously tumid and rugose.

Lower Guinea. Pungo Andongo, Angola, 2400–3800 ft. *Dr. Welwitsch!*

71. **I. Spachii,** *Baker.* An erect undershrub 1–2 ft. high, the branches ascending, slender, thinly silky. Stipules linear-setaceous. Petioles erecto-patent, $\frac{1}{2}$ in. long. Leaflets 5, oblong or obovate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, apex rounded mucronate, lateral ones opposite, short-stalked, surfaces thinly silky. Racemes in flower about 2 in. long, the upper ones sessile, the lower on erecto-patent peduncles an inch or more long. Calyx $\frac{1}{8}$ in. deep, the teeth linear, unequal, reaching more than half way down. Corolla reddish, twice as long as the calyx, silky externally. Pod deflexed, linear, mucronate, very slightly upcurved, 1–$1\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, 8–10-seeded, thinly silky, subtorulose. *I. coronilloides*, Jaub. et Spach. Ill. Pl. Orient. t. 485–6 non Mart. et Gal.

Nile Land. Mountains of Abyssinia, *Schimper!*

72. **I. Quartiniana,** *A. Rich. Fl. Abyss.* i. 183. Stem woody erect, 2–3 ft. high, the branches ascending, elongated, firm, slender, sulcate, thinly silky. Stipules small, slender. Petioles slender, under $\frac{1}{2}$ in. long. Leaves with 2–3 pairs of leaflets, which are oblong, $1\frac{1}{2}$ in. long, under half as broad, the lateral ones opposite, short-stalked, both sides thinly silky. Racemes at first about an inch long on peduncles which nearly or quite equal them. Calyx 2 lines long, thinly silky, the teeth linear-subulate, reaching down nearly to the base. Corolla purplish, twice as long as the calyx. Pod spreading or slightly deflexed, linear

mucronate, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, 1 line thick, tetragonous, subglabrous, 6–10-seeded.

Nile Land. Abyssinia, *Quartin-Dillon!* Nubian coast, *Schweinfurth!*

73. **I. semitrijuga,** *Forsk.; DC. Prod.* ii. 230. Stem fruticose, a foot or more high, copiously and diffusely branched from the base, the branches erecto-patent, firm, terete, glaucous-silvery. Stipules minute, setaceous. Petioles $\frac{1}{2}$ in. long. Leaves $\frac{1}{2}$ in. long or rather more, with usually 3 pairs of close sessile obovate leaflets, which are $1\frac{1}{2}$–2 lines long, the end one stalked, base cuneate, apex rounded mucronate, texture firm, both sides silvery. Flowers in short-stalked lax racemes of 6–12 flowers each exceeding the leaves. Calyx short-stalked, very silky, a line deep, the lower teeth linear, reaching half way down, the others shorter. Corolla more than twice as long as the calyx, thinly silvery on the outside. Pods spreading, linear-mucronate, $\frac{3}{8}$ in. long, 1 line broad, terete, finely silky, 2–4-seeded.—*I. argentea*, Burm. Fl. Ind. 171 non Linn.

Nile Land. Abyssinia (*teste Schweinfurth*), Nubia, Kordofan and Sennaar, *Kotschy! Schweinfurth!*

Extends from Egypt through Arabia to Scinde.

74. **I. pruinosa,** *Welw. mss.* A shrub 2 ft. high with strong terete woody branches which like the rest of the plant are densely argenteo-canescent. Petioles 2–3 lines. Leaves 6–12 lines. Leaflets 5–7, very thick, rigidly coriaceous, densely silvery on both sides, often complicate, very deciduous in the dried plant, the end one short-stalked or sessile, the side ones opposite. Flowers about a dozen in dense short-stalked racemes which exceed the leaves a little. Pedicels very short. Calyx $\frac{1}{8}$ in. long, argenteous, oblique, the lanceolate teeth much shorter than the tube. Corolla violet-purple, nearly twice the calyx, glabrous externally. Pod straight, coriaceous, terete, 15–16 lines long, $\frac{1}{8}$ in. broad, brown, slightly canescent, many-seeded.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch!*

75. **I. Schimperi,** *Jaub. et Spach. Illust. Pl. Or.* t. 484. A much-branched shrub reaching a height of 10 ft., the branches ascending, silvery, flexuose, woody. Stipules linear from a dilated base. Petioles $\frac{1}{4}$ in. long, erecto-patent. Leaflets 5–7, obovate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, the apex rounded, often emarginate, the lateral ones alternate, distinctly stalked, both sides densely argenteous. Flowers in rather close axillary racemes at first about an inch long, finally 4 or 5 in. long, on short erecto-patent peduncles. Calyx a line deep, silvery, the teeth subequal, lanceolate, acuminate, not reaching more than halfway down. Corolla purplish, three or four times as long as the calyx, silky on the outside. Pod deflexed, linear, mucronate, 1 in. or more long, straight, thinly silky when young.—*I. tettensis*, Klotzsch in Peters' Mossamb. Bot. 51.

Nile Land. Nubia, *Schweinfurth!* Abyssinia, *Schimper!*

Mozamb. Distr. Zambesi land, *Peters!* Banks of a stream in 7° 20 S. lat., 38° E. long., *Speke and Grant!*

As silvery as *I. paucifolia* and *argentea*, and formerly cultivated in Zambesi land.

76. **I. atriceps,** *Hook. f. in Journ. Linn. Soc.* v. 190. An undershrub 2–3 ft. high, the branches firm, subterete, with a few spreading setæ when young, glabrous when mature. Stipules setaceous. Petioles very short. Leaflets 9–13, oblanceolate or obovate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, apex rounded mucronate, lateral ones contiguous, opposite, short-stalked, texture firm, upper surface green, lower glaucous, both very thinly silky. Racemes dense, 1–$1\frac{1}{2}$ in. long, on firm erecto-patent peduncles 2 in. long, which like the rachis of the flower-cluster are coated with black pubescence. Calyx 2 lines, with dense similar pubescence, the teeth linear-subulate, reaching down nearly to the base. Corolla purplish, half as long again as the calyx. Pod spreading, linear-mucronate, $\frac{3}{8}$ in. long, a line broad, densely clothed with close black pubescence, and scattered longer pale brown gland-tipped hairs, 6–8-seeded.

Upper Guinea. Cameroon Mountains, at 7000 ft., *Mann!*

77. **I. secundiflora,** *Poir.; DC. Prod.* ii. 228. Stem herbaceous or slightly shrubby, copiously and diffusely branched, more or less densely clothed with spreading grey or ferruginous hairs intermixed with abundant deciduous stalked glands. Stipules subulate. Leaves subsessile, with 4–6 pairs of leaflets, oblong or obovate, $\frac{3}{8}$–$\frac{1}{2}$ long, the apex rounded and mucronate, the lateral ones opposite, short-stalked, both sides rather densely grey-silky. Racemes copious, dense, $1\frac{1}{2}$–2 in. long, on erecto-patent peduncles clothed like the stem and from $\frac{1}{4}$–1 in. long. Calyx densely silky, $\frac{1}{8}$ in. long, the teeth subulate, reaching down nearly to the base, often black. Corolla reddish, slightly exceeding the calyx. Pods linear-oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long, straight, horizontal, densely clothed with spreading grey or ferruginous often gland-bearing hairs, 2–4-seeded.—*I. oligosperma*, DC. Prod. l.c.; Guill. et Perr. Fl. Seneg. i. 181; A. Rich. Fl. Abyss. i. 181. *I. glutinosa*, Schum. et Thonn. Pl. Guin. 370, non DC. *I. melanotricha*, Steud. in Schimp. Hb. Abyss. No. 761. *I. urostachya*, Fenzl in Kotsch. Pl. Æthiop. 509.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Perrottet! Heudelot!* Guinea proper, *Thonning, Mylne! Barter!*

Nile Land. Nubia, *Kotschy! Schweinfurth!* Abyssinia, *Schimper!* and others. Unyoro, *Speke and Grant!*

Varies considerably in robustness, the colour of the pubescence and quantity and colour of the setæ, which are sometimes a beautiful purple. A plant, of which there is a single specimen in the Afzelian herbarium, gathered by Brass at Sierra Leone, resembles this closely in general habit and leaf. It has a longer calyx (12 lines long), densely clothed with brown silky hairs, with lanceolate-setaceous teeth reaching down nearly to the base. No doubt it is distinct, but there are neither good flowers nor fruit.

78. **I. Perrottetii,** *DC. Prod.* ii. 228. Stem a foot or more long, herbaceous, moderately stout, trailing, branched from the base, thinly silky upwards. Stipules linear. Petioles spreading or erecto-patent, under half an inch long. Leaves with 3–5 pairs of leaflets, oblanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, the apex rounded and mucronate, the lateral ones opposite, both sides glaucous and thinly silky, and the lower also dotted

with black glands. Flowers in dense nearly sessile axillary racemes an inch or more long. Calyx $\frac{1}{8}$ in. deep, thinly silky, the teeth setaceous, reaching down nearly to the base. Corolla red, about equalling the calyx. Pod deflexed, oblong, mucronate, $\frac{1}{4}$ in. long, $\frac{1}{8}$ in. thick, subterete, slightly torulose, thinly villose, 2–3-seeded.—Guill. et Perr. Fl. Seneg. 185.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*

Very like *I. endecaphylla* in texture and general habit, different by its opposite leaflets, conspicuously dotted beneath, and in its pods.

79. **I. costata,** *Guill. et Perr. Fl. Seneg.* 187. Stem herbaceous, 18 in. high, erect, scarcely branched, angular, scabrous, thinly hairy. Stipules minute, filiform, spreading, ciliated. Petioles under $\frac{1}{2}$ in. long. Leaves with 6–7 pairs of leaflets, oval-oblong, 8–10 lines long, mucronate, the lateral ones opposite, colour pale green, both sides thinly hairy. Flowers in slender axillary racemes 2–3 in. long on peduncles as long as themselves. Calyx a line deep, thinly hairy, the teeth linear, reaching more than halfway down. Corolla rose-coloured, twice as long as the calyx. Pod linear, mucronate, straight, subcompressed, deflexed, about 1 in. long, adpressedly pilose, 15–20-seeded.

Upper Guinea. Senegambia, *Perrottet!*

Very near *I. parviflora*, but the leaves broader, and racemes with stalks that equal them.

80. **I. daleoides,** *Benth.; Harv. Fl. Cap.* ii. 200. A copiously branched argenteous perennial herb with slender trailing stems 1–2 ft. long. Stipules linear, minute, spreading, persistent. Leaves subsessile, 8–12 lines long; leaflets 7–13, obovate-oblong, 3–4 lines long, blunt, minutely mucronate, very thick in texture, both sides densely and persistently argenteo-canescent, the end one subsessile or short-stalked, the side ones alternate. Racemes 12–30-flowered, conical, 6–9 lines, finally 12–18 lines long, on peduncles which usually exceed the leaves. Calyx $\frac{1}{8}$ in. long, subsessile, densely clothed with long whitish hairs, the plumose setaceous teeth reaching down nearly to the base. Corolla violet, scarcely exceeding the calyx, the standard slightly grey-hairy on the outside. Pod deflexed, linear, 6–7 lines long, 1 line thick, shortly grey-pubescent, 9–10-seeded.

Lower Guinea. Benguela, in the sands of the seashore, *Dr. Welwitsch!*

A Cape species.

81. **I. enneaphylla,** *L.; DC. Prod.* ii. 229. Annual or biennial, copiously stellately branched at the crown of the root with firm terete stems a foot or more long, grey-downy upwards. Stipules setaceous, 1–1½ lines. Petioles 2–4 lines, often patent or deflexed. Leaves 9–18 lines long; leaflets 7–11, oblanceolate, blunt, often emarginate, grey and more or less argenteous on both sides, 3–6 lines long, the end one distinctly stalked, the side ones opposite. Flowers in very dense racemes 1–2 in. long on very short peduncles. Calyx 1 line, densely grey-silky, the linear setaceous teeth reaching down nearly to the base.

Corolla violet-purple, twice the calyx. Pod 2–3 lines long, ¾–1 line thick, turgid, distinctly torulose, persistently grey-pubescent, the hairs not gland-tipped. Seeds 2–3.

Lower Guinea. Loanda, *Dr. Welwitsch!*
A common East India species.

82. **I. endecaphylla,** *Jacq.; DC. Prod.* ii. 228. An annual or biennial with copiously branched suberect or prostrate stems 1–3 ft. long, thinly grey-hispid upwards. Stipules 3–4 lines, lanceolate, acuminate, membranous, persistent. Leaves 1–2½ in. long; leaflets 7–9, oblanceolate-oblong, 6–12 lines long, blunt with a mucro, greenish and glabrescent above, glaucous and inconspicuously grey-hispid below, all distinctly stalked, side ones alternate. Racemes dense, 1–4 in. long on peduncles 3–18 lines long. Pedicels very short. Calyx 1–1½ lines long, the setaceous teeth reaching three-quarters of the way down. Corolla violet-purple, twice the calyx, glabrous externally. Pods deflexed, linear, 8–10 lines long, 1 line thick, subglabrous, 6–8-seeded.—Beauv. Fl. d'Oware t. 84. *I. anceps*, Vahl, Poir. Enc. Suppl. iii. 147. *I. Schimperiana*, Hochst. in Schimp. Hb. Abyss. No. 366.

Upper Guinea. Senegambia, *Perrottet!* Gold Coast, *Beauvois, Thonning,* and others. Island of St. Thomas, *G. Don!* Dahomey, *Capt. Burton!*
Nile Land. Nubia, *Schweinfurth.* Abyssinia, *Schimper! Quartin-Dillon!* and others. Makata, *Speke and Grant!*
Lower Guinea. Congo, and most of the provinces of Angola, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Meller!*
Extends southward to Natal and the Cape.

Var. *radicans*, Welw. Stems and branches quite trailing, rooting downwards. Leaves 9–12 lines long; leaflets 3–5. Calyx ⅛ in. Corolla not more than half as long again as the calyx. Pod 5–6 lines long, 4–5-seeded.

Lower Guinea. Highlands of the province of Huilla, *Dr. Welwitsch!*

83. **I. phyllanthoides,** *Baker.* An undershrub 2–3 ft. high with very numerous ascending finely grey-downy branches. Stipules 1 line, setaceous, persistent. Leaves subsessile, 9-18 lines long; leaflets 9–11, obovate, ¼–⅜ in. long, 2–2½ lines broad, grey and persistently scabrous with minute grey bristles on both sides, all distinctly stalked, the side ones opposite. Racemes exceeding the leaves, 12–20-flowered, 1½–2 in. long, shortly peduncled. Bracts like the stipules. Pedicels ½ line, cernuous, brown-silky. Calyx ¾ line, densely coated with mixed brown and grey bristles, teeth setaceous, rather exceeding the tube. Corolla ¼ in.. violet, less fugacious than in most of its allies, densely brown-silky on the outside. Ovary linear, clothed with adpressed grey bristles, multiovulate. Pod not seen.

Lower Guinea. Highlands of Huilla province, Benguela, 5400 ft., *Dr. Welwitsch!*

84. **I. subulifera,** *Welw. mss.* Suffruticose, 1½–3 ft. high, erect, copiously branched, the erecto-patent rigid slender branches finely grey-downy. Stipules minute, linear, persistent. Petioles 1–4 lines long. Leaves 1–3 in. long; leaflets 7–13, oblong or oblanceolate, reaching 6–9 lines long, 2–3 lines broad, acute, greenish and thinly

bristly above, grey and more densely bristly beneath, all distinctly stalked, the side ones opposite. Flowers 12–20 in very numerous moderately dense nearly sessile racemes, the upper exceeding the much-reduced leaves. Pedicels very short. Calyx $\frac{1}{8}$ in. long, densely grey-hispid, the setaceous teeth reaching down nearly to the base. Corolla reddish purple, 4 lines long, grey-hispid externally. Pod oblong, tipped with the persistent style, 2 lines long, 1 line thick, usually 2-casually 1-seeded.

Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

85. **I. amorphoides,** *Jaub. et Spach, Illust. Pl. Orient.* t. 483. A copiously branched shrub several feet high, the branches firm, straight, deeply sulcate, thinly silky. Stipules linear, deciduous. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long, firm, erecto-patent. Leaves 2–3 in. long; leaflets 8–9 pairs, oblanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, apex often emarginate, lateral ones close, opposite, distinctly stalked, both sides subglaucous, thinly silky, turning blackish when dried. Racemes 20–30-flowered, sessile, ultimately 2 in. long. Pedicel equalling the thinly silky obliquely campanulate calyx, which is $\frac{1}{2}$ line deep, the lower teeth lanceolate, reaching about halfway down, the upper deltoid shorter. Corolla yellow, three or four times as long as the calyx. Pod oblong-mucronate, $2\frac{1}{2}$–3 lines long by half as broad, glabrous and bright chestnut-brown when mature, slightly compressed, 2–3-seeded.—*I. abyssinica,* Hochst. in Schimp. Pl. Abyss. No. 2213. *I. alta,* Schweinf. Fl. Æthiop. 11.

Nile Land. Abyssinia, *Schimper!*

General habit of *I. arrecta,* but the flowers more copious, and pods quite different from all the rest of the group.

86. **I. arrecta,** *Hochst. in Schimp. Hb. Abyss.* No. 1923. A copiously branched shrub several feet high, the branches straight, deeply sulcate, thinly silky. Stipules linear, deciduous. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long, firm, slender, erecto-patent. Leaves 2–3 in. long, leaflets 6–8 pairs, oblanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, the lateral ones opposite, short-stalked, both sides subglaucous and thinly silky, turning blackish when dried. Racemes 6–12-flowered, sessile or nearly so, not more than an inch long. Pedicels equalling the thinly silvery calyx, which is not more than half a line deep, obliquely campanulate, the upper teeth deltoid, the lower lanceolate not reaching halfway down. Corolla yellow, four times as long as the calyx. Pods deflexed, straight, linear-mucronate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, a line thick, terete, polished, chestnut-brown when mature, 6–8-seeded.—A. Rich. Fl. Abyss. i. 184.

Nile Land. Sennaar, *Cienkowsky.* Abyssinia, *Schimper! Quartin-Dillon and Petit! Roth!* Native name, *Degendeg.*

This and the preceding have more numerous, closer, and smaller leaves than the rest of the officinal species. *I. arrecta* of Harvey, Fl. Cap. ii. 183, is a different plant, and will have to take a new name.

87. **I. argentea,** *Linn.; DC. Prod.* ii. 224. A copiously branched shrub several feet high, the branches firm, sulcate, silvery. Stipules

small, setaceous. Petioles $\frac{1}{2}$ in. long, firm, erecto-patent. Leaves 2–2$\frac{1}{2}$ in. long with 4 pairs of leaflets, which are obovate, $\frac{3}{4}$–1 in. long, the lateral ones opposite, short-stalked, both sides permanently silvery, turning blackish when dried. Racemes 12–20-flowered, 1–1$\frac{1}{2}$ in. long when in flower, sessile or nearly so. Pedicel about equalling the silvery calyx, which is half a line deep, teeth reaching about halfway down. Corolla yellow, about 4 times as long as the calyx. Pod deflexed, sickle-shaped, $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. thick, terete, slightly torulose, glabrous when mature, 3–4-seeded.—A. Rich. Fl. Abyss. i. 184. *I. glauca*, Lam. Encycl. iii. 246. *I. tinctoria*, Forsk. Ægypt. 138 non Linn. *I. articulata*, Gouan, Illust. 49. *I. cærulea*, Roxb. Fl. Ind. iii. 337. Wight. Ic. ii. t. 366.

Nile Land. Nubia, *Kotschy! Schweinfurth!* Abyssinia, *Schimper! Roth!*
Also wild and cultivated in the Barbary States, Egypt, and Arabia, and the East Indies. Much more argenteous than *I. Anil*, which it resembles in its sickle-shaped pod, with fewer leaves and seeds.

88. **I. Anil,** *Linn.; DC. Prod.* ii. 225. A copiously branched shrub 3–5 ft. high, branches straight, woody, deeply sulcate, thinly silvery. Stipules small setaceous. Petiole under $\frac{1}{2}$ in. long, firm, erecto-patent. Leaves 2–4 in. long, leaflets 6–8 pairs, oblong or obovate, $\frac{3}{4}$–1 in. long by about half as broad, lateral ones opposite, short-stalked, both sides subglaucous and thinly silvery, upper one nearly or quite glabrous when mature, turning blackish when dried. Racemes moderately dense, 1–2 in. long when in flower, nearly sessile. Pedicel equalling the obliquely campanulate thinly silvery calyx, which is not more than half a line deep, the lower teeth lanceolate, reaching halfway down, the upper shorter. Corolla fugacious, yellow, four times as long as the calyx. Pod reflexed, sickle-shaped, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. thick, subtetragonous with thickened sutures, glabrous when mature, 6–8-seeded.—Guill. et Perr. Fl. Seneg. i. 178. *I. uncinata*, G. Don, Gard. Dict. ii. 208.

One of the species most commonly cultivated. We have it from Senegambia, Sierra Leone, Guinea, Mozambique, Angola, and Zambesi land It is said to be a native of Tropical America, and is subspontaneous in Tropical Africa in various places, especially along the coast about Sierra Leone.

89. **I. umbonata,** *Welw. mss.* A rigid undershrub 2 ft. high with terete woody grey sulcate finely grey-hispid long stiff branches. Stipules setaceous very minute. Petioles 3–6 lines. Leaves 2–2$\frac{1}{2}$ in. long, leaflets 11–13, obovate-oblong, reaching 6–7 lines long, $\frac{1}{4}$ in. broad, blunt with a minute mucro, glaucous and finely grey-hispid on both sides, all distinctly stalked, the side ones opposite. Racemes sessile, 12–20-flowered, 6–9 lines long. Calyx and pedicels each $\frac{1}{2}$ line long, the former brown-silky, its teeth deltoid, shorter than the tube. Corolla 1$\frac{1}{2}$–2 lines long, brownish when dried, finely clothed externally with adpressed silky hairs. Pod 6–9 lines long, 1$\frac{1}{4}$ line thick, terete, straight, glabrous, 6–8-seeded, with a small prominent umbonate ring at the point.

Lower Guinea. Highlands of Pungo Andongo, Angola, *Dr. Welwitsch!*
Very near *I. tinctoria*, from which it differs principally in the pod.

90. **I. orthocarpa,** *Baker.* A copiously branched shrub with woody angular thinly silvery branches. Stipules small, setaceous. Petioles $\frac{1}{2}$ in. long, firm, erecto-patent. Leaves 2–3 in. long, leaflets 4–6 pairs, obovate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, about half as broad, both sides permanently thinly silvery, lateral ones opposite, short-stalked, turning blackish when dried. Racemes sessile, 12–20-flowered, about an inch long when in flower, ultimately equalling the leaves. Pedicel equalling the silvery calyx, which is half a line deep, the teeth lanceolate, reaching halfway down. Corolla yellow, four times as long as the calyx. Pod deflexed, 1–1$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, straight, subterete, naked, 8–12-seeded.—*I. Anil.* var. *orthocarpa*, DC. Prod. ii. 225.

North Central. Kouka, *E. Vogel!*
Nile Land. Nubia, Kordofan, Sennaar, and banks of the Blue Nile at Khartoum *Kotschy!*
Habit of *I. Anil*, but the leaves fewer and more argenteous, and in the straight pod and number of seeds agreeing with *I. tinctoria.*

91. **I. tinctoria,** *Linn.; DC. Prod.* ii. 224. A copiously branched shrub 4–6 ft. high, the branches straight or flexuose, sulcate, thinly silky. Stipules small, setaceous. Petioles $\frac{1}{2}$–1 in. long, firm, erecto-patent. Leaves 2–3 in. long, with leaflets 4–6 pairs, oblong or obovate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, both sides subglaucous and thinly silvery, the lateral ones opposite, short-stalked, turning slightly blackish when dried. Racemes axillary, lax, about 20-flowered, ultimately equalling or a little exceeding the leaves. Pedicel shorter than the silvery calyx, which is more than half a line deep, teeth lanceolate, reaching halfway down. Corolla more than two lines long, yellow or purplish. Pods deflexed, 1–1$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. thick, subterete, straight or nearly so, glabrous when mature, 8–12-seeded.—Wight. Ic. ii. t. 315. Guill. et Perr. Fl. Seneg. i. 178. *I. indica*, Lam. Encycl. iii. 245. *I. ornithopodioides*, Schum. et Thonn. Pl. Guin. 372.

Universally cultivated. Wild in Senegambia, and perhaps elsewhere.

92. **I. emarginella,** *Steud. in Schimp. IIb. Abyss.* No. 735. A woody erect shrub 3–4 ft. high, with firm terete branches, only thinly pubescent upwards, not at all silky or argenteous. Stipules linear-setaceous. Petioles $\frac{1}{2}$ in. long, erecto-patent. Leaves with usually 4 pairs of elliptical or obovate leaflets, $\frac{1}{2}$–1 in. long, the apex rounded and distinctly mucronate, the lateral ones contiguous, opposite, distinctly stalked with minute setaceous stipellæ, texture subcoriaceous, upper surface green, lower glaucous, both when mature glabrous. Flowers in dense nearly or quite sessile axillary conical racemes 12–18 lines long. Calyx $\frac{1}{2}$ line deep, obliquely campanulate, thinly clothed with brownish pubescence, the teeth deltoid. Corolla $\frac{1}{4}$ in. long, bright yellow when fresh, brown when dried, the oblong standard glabrous externally. Pods deflexed, linear, mucronate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 1 line broad, nearly straight, terete, glabrous when mature, 6–8-seeded.—

A. Rich. Fl. Abyss. i. 185. *I. coluteifolia*, Jaub. et Spach, Illust. Pl. Orient. t. 487–8.

Nile Land. Abyssinia, *Schimper!* Karaguè, *Speke and Grant!*
Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

93. **I. macrophylla,** *Schum. et Thonn. Pl. Guin.* 372. An erect very much branched shrub 6–12 ft. high, with firm terete glabrous branches. Stipules minute, linear, deciduous. Petioles $\frac{1}{2}$–1 in. Leaves 3–4 in. long; leaflets usually 9, obovate, blunt with a minute mucro, reaching 12–18 lines long, 9–10 lines broad, subcoriaceous, glabrous, all distinctly stalked with minute setaceous stipellæ. Flowers 20–40 in moderately dense peduncled conical racemes an inch broad which exceed the leaves. Pedicels 1 line long. Bracts minute, setaceous, deciduous. Calyx $\frac{1}{2}$ line, subglabrous, the teeth deltoid as long as the tube. Corolla 4–5 lines long, variegated with red and green, glabrous externally. Pods deflexed, linear, 12–15 lines long, $\frac{1}{8}$ in. broad, nearly straight, glabrous, terete, 6–8-seeded.

Upper Guinea. Senegambia, *Heudelot!* Guinea proper, *Thonning, Barter!* Sierra Leone, *Afzelius!*
Lower Guinea. Pungo Andongo, Angola, 2400-3800 ft., *Dr. Welwitsch!*

94. **I. dendroides,** *Jacq.; DC. Prod.* ii. 227. Stem 1–2 ft. high, herbaceous, erect, copiously branched, the branches ascending, slender, slightly silky. Stipules minute subulate. Leaves of the main stem subsessile, 2–3 in. long, leaflets 10–15 pairs, oblanceolate or oblong, 3–4 lines long, apex rounded mucronate, lateral ones opposite on distinct stalks about 2 lines apart, both sides glaucous, slightly silky. Flowers in very lax racemes of 8–12 flowers each on slender erecto-patent peduncles an inch or more long. Lower pedicels twice as long as the calyx, which is thinly silky, under a line deep, the teeth linear, reaching down nearly to the base. Corolla deep rose-coloured, three or four times as long as the calyx. Pod linear, mucronate, 1–1$\frac{1}{2}$ in. long, 1 line broad, subtetragonous, subglabrous, 10–12-seeded.—Schum. et Thonn. Pl. Guin. 375. Guill. et Perr. Fl. Seneg. 181.

Upper Guinea. Senegambia, *Perrottet!* Guinea proper, *Thonning, Brass! Vogel!* and others. Sierra Leone, *Afzelius!*
Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*
Herbaceous, with the habit of § Dissitifloræ, but the flowers more numerous.

95. **I. viscidissima,** *Baker.* A copiously branched erect perennial herb with the main stem and all the branches very densely coated with stalked brown glands. Stipules setaceous, 1 line, persistent, spreading. Petioles 3–4 lines. Leaves 1$\frac{1}{2}$–3 in.; leaflets 11–19, oblong, 4–6 lines long, blunt with a distinct mucro, both sides grey, densely hispid, very scabrous, all distinctly stalked, the side ones opposite. Flowers 12–20 in moderately dense racemes 1$\frac{1}{2}$–2 in. long on short erecto-patent peduncles. Pedicels $\frac{1}{2}$ line. Calyx $\frac{1}{8}$ in. long, densely viscous, the setaceous teeth reaching down nearly to the base. Corolla purplish-red, very fugacious, equalling the calyx. Pod linear, straight, grey, many-seeded, densely clothed with stalked glands, not seen fully mature.

Lower Guinea. Highlands of the province of Huilla, Benguela, *Dr. Welwitsch!*

96. **I. sutherlandioides,** *Welw. mss.* An undershrub, with erect, woody stems with several rigidly erecto-patent branches, densely clothed with short brownish-grey pubescence. Stipules 2–3 lines, setaceous, persistent. Petioles 3–4 lines. Leaves 2–2½ in. long; leaflets 13–19, subcoriaceous, 5–6 lines long, grey and finely silky above, densely white-silky beneath with the midrib brownish, the side ones lanceolate or oblong-lanceolate, acute, usually opposite, the end one stalked, oblanceolate, blunt, both with a conspicuous mucro. Flowers in moderately dense short-stalked racemes 15–18 lines long, an inch broad. Pedicels ½–¾ line, densely grey-silky. Calyx ½ line, densely grey-silky, teeth deltoid, shorter than the tube. Corolla 4–5 lines long, dark purple, the standard glabrous externally. Pods straight, dark purple, 18–21 lines long, 2 lines broad, glabrous, 12–15-seeded.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

97. **I. fulgens,** *Baker.* A copiously branched shrub, with firm, flexuose branches, clothed upwards with short spreading brown pubescence. Stipules half an inch long, setaceous, ciliated. Petioles ½–¾ in. long, firm, erecto-patent. Leaves 5–6 in. long, with about 10 pairs of stalked oblong or slightly obovate leaflets, an inch or rather more long, not half as broad, distinctly mucronate, green, not at all glaucous, both sides slightly pubescent. Racemes lax, short-stalked, finally nearly as long as the leaves. Pedicel equalling the calyx, which is a line deep, thinly silky, campanulate, the teeth lanceolate, reaching halfway down. Corolla bright red, ⅝ in. long, the standard spathulate, 2 lines broad. Pod linear-mucronate, 1½ in. long, ⅛ in. thick, glabrous, slightly torulose, 10–12-seeded.

Mozamb. Distr. Banks of the Rovuma, *Dr. Kirk!*
This has much the largest and most showy flowers of all the Tropical African species.

98. **I. Hochstetteri,** *Baker.* Stems herbaceous, a foot or more long, copiously and diffusely branched from the base, the branchlets slender, angular, moderately silvery. Stipules minute, setaceous. Petioles ¼–½ in. long. Leaflets in 1–3 pairs, oblong-lanceolate, ½–1 in. long, the lateral ones distant, slightly stalked, the apex rounded and mucronate, both sides glaucous, and permanently thinly coated with strong adpressed silvery hairs. Flowers in close oblong racemes of about 12 each, not above ½ in. long till the fruit is produced, on peduncles ¼ in. or less long. Calyx silvery, ⅛ in. deep, cut down nearly to the base, the teeth setaceous, the lowest the longest. Corolla pink, about equalling the calyx. Pods deflexed and then again slightly recurved, linear-mucronate, ½–¾ in. long, ⅛ in. broad, 6–8-seeded.—*I. ornithopodioides,* Hochst. et Steud. in Schimp. Hb. Arab. No. 769. Jaub. et Spach, Illust. Pl. Or. t. 480, non Schum. et Thonn. nec Cham. et Schlecht.

Nile Land. Nubia, *Kotschy! Petherick!* Abyssinia, *Schimper! Roth!*
Extends through Arabia to Scinde.

99. **I. oligophylla,** *Klotzsch in Peters' Mossamb. Bot.* 49. Stem herbaceous, a foot long, copiously and diffusely branched from the base, the branches slender, terete, silvery. Stipules small, setaceous. Petioles $\frac{1}{2}$ in. long. Leaves with 1–2 pairs of narrowly oblanceolate leaflets, $\frac{1}{2}$–1 in. long, 2 lines broad, apex rounded, mucronate, both sides densely clothed with adpressed silvery hairs. Flowers in long stalked racemes of 10–15 flowers each which equal the leaves, the peduncle 1–2 in. long. Bracts short, cymbiform, acuminate, persistent. Calyx silvery, $\frac{1}{8}$ in. deep, cut down nearly to the base, the teeth setaceous. Corolla about equalling the calyx. Pods deflexed, and then again slightly recurved, linear-mucronate, $\frac{1}{2}$ in. long, 1 line broad, 4–6-seeded.

Mozamb. Distr. Island of Goa, *Peters!*

Closely allied to *I. ornithopodioides*, but more silvery, with smaller pods, fewer leaflets and seeds, and longer peduncles and petioles.

100. **I. aspera,** *Perr. in DC. Prod.* ii. 229. Stem herbaceous, a foot or more long, erect or diffusely branched from the base, the branchlets slender, angular, moderately silvery. Stipules minute, setaceous. Petioles $\frac{1}{4}$–$\frac{3}{8}$ in. long. Leaflets usually 2 pairs, lateral ones opposite, distant, nearly sessile, all linear-lanceolate, 1–$1\frac{1}{2}$ in. long, 2–3 lines broad, apex rounded, mucronate, both sides glaucous, and permanently thinly coated with strong adpressed silvery hairs. Flowers in axillary racemes 2–3 in. long, of 20–30 each, on peduncles $\frac{1}{4}$–$\frac{1}{2}$ in. long. Bracteoles setaceous, deciduous, exceeding the short silky pedicels. Calyx silky, $\frac{1}{8}$ in. deep, cut down nearly to the base, the teeth setaceous, the two lowest the longest. Corolla rose-coloured, twice as long as the calyx, the standard silvery on the outside. Pods deflexed, straight, linear, mucronate, 1 in. long, 1 line thick, thinly silky, 10–12-seeded.—Guill. et Perr. Fl. Seneg. 184.

Upper Guinea. Senegambia, *Leprieur and Perrottet! Heudelot!* Niger country, *Barter!*

Nile Land. Kordofan and the White Nile tract, *Kotschy! Binder, Heuglin.*

Lower Guinea. Mossamedes, *Dr. Welwitsch!*

101. **I. sengalensis,** *Lam.; DC. Prod.* ii. 228. Stem herbaceous, a foot or more long, erect or copiously and diffusely branched, the branchlets slender, angular, moderately silvery. Stipules minute, setaceous. Petioles slender, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaflets in 1–3 pairs, linear, 1–$1\frac{1}{2}$ in. long, 2–3 lines broad, point rounded, mucronate, lateral ones distant, nearly sessile, both sides glaucous, and permanently thinly coated with strong adpressed silvery hairs. Flowers in axillary racemes 1–2 in. long, of 20–30, on peduncles $\frac{1}{2}$–$\frac{3}{4}$ in. long. Bracteoles setaceous, deciduous, exceeding the short silky pedicels. Calyx silky, $\frac{1}{8}$ in. deep, cut down nearly to the base, the teeth setaceous, the two lowest the longest. Corolla pink, twice as long as the calyx, the standard silky on the outside. Pods deflexed, linear-oblong, straight, mucronate, $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, thinly silky, 3–4-seeded.—Guill. et Perr. Fl.

Seneg. 183. *I. tenella*, Schum. et Thonn. Pl. Guin. 367. *Brissonia trapezicarpa*, Desv. in Ann. Sc. Nat. sér. 1, ix. 409.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Roger!*

102. **I. arabica,** *Jaub. et Spach, Illust. Pl. Or.* t. 479. Stem nearly or quite woody below, diffusely branched from the base, about a span high, young branches firm, angular, densely silky. Stipules small, setaceous. Petioles very short. Leaflets 3–5, obovate or oblanceolate, $\frac{1}{4}$–$\frac{3}{8}$ in. long, 2–3 lines broad, lateral ones sessile and close, all often folded with a decurved point, texture thick, both sides densely and permanently silvery. Flowers in short close racemes of 6–10 each, which are nearly sessile in the axils of the leaves. Pedicels very short. Calyx campanulate, silvery, $\frac{1}{8}$ in. deep, the teeth subequal, setaceous, reaching three-quarters of the way down. Corolla scarlet, nearly twice as long as the calyx, silvery externally. Pod $\frac{1}{4}$–$\frac{3}{8}$ in. long, 1 line broad, linear-oblong mucronate, subtorulose and slightly silvery, 4–5-seeded.

Nile Land. Banks of the White Nile, *Petherick!*
Also inhabits Arabia. The pod is not so thoroughly flattened as in the other species.

103. **I. ervoides,** *A. Rich. Pl. Abyss.* i. 1179. Stem herbaceous, diffusely branched from the base, about a span high, the branchlets slender, angular, thinly silky. Stipules linear. Petioles $1\frac{1}{2}$–2 lines long. Leaflets 3, rarely 5, oblanceolate, the terminal one $\frac{1}{2}$–$\frac{5}{8}$ in. long, 2 lines broad, stalked, the lateral ones similar, sessile, upper surface green, glabrous when mature, lower grey-green, thinly silvery. Flowers in close racemes of about 12 each, under half an inch long, on peduncles half their length from the axils of the leaves. Calyx silky, a line deep, the teeth linear-setaceous, reaching down nearly to the base. Corolla pink, about equalling the calyx. Pod subelliptical acuminate, 3–$3\frac{1}{2}$ lines long, $\frac{1}{8}$ in. broad, silky, 2-seeded.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon!*

19. SYLITRA, E. Meyer; Benth. et Hook. f. Gen. Plant. i. 496.

Calyx-tube turbinate with five subequal teeth. Standard obovate-spathulate, narrowed gradually into a claw; wings falcate-oblong, as long as the standard; keel incurved, blunt, shorter. Stamens connate in a tube slit along the top; anthers uniform. Ovary subsessile, multi-ovulate, narrowed gradually into the incurved filiform glabrous style; stigma capitate. Pod oblong, flat, membranous, 4–6-seeded, subindehiscent.—Perennials with the habit of *Tephrosia* and pod of *Lessertia*.

One other species known at the Cape with simple leaves.

1. **S. angolensis,** *Baker.* A thinly argenteo-canescent perennial with flexuose slender stems a foot high. Stipules minute, linear, persistent. Leaves short-stalked, digitately trifoliolate; leaflets linear, 12–15 lines long, 1–$1\frac{1}{2}$ lines broad, bluntish with a small mucro, rigidly coriaceous, grey-green, prominently veined. Flowers solitary, nearly sessile in the axils of the leaves. Calyx 1 line deep, clothed with ad-

pressed yellow silky hairs, the lanceolate teeth rather shorter than the tube. Corolla yellowish, nearly twice the calyx. Pod 9–10 lines long, 4 lines broad, inconspicuously silky.

Lower Guinea. Mossamedes, Benguela, in dry places near Maianbo, *Dr. Welwitsch!*

Near the Cape species in everything but its compound leaves.

20. **TEPHROSIA,** Pers.; Benth. et Hook. f. Gen. Plant. i. 496.

Calyx-teeth subequal, or the lower longer than the rest, varying from deltoid to subulate. Petals unguiculate; standard suborbicular; wings obliquely obovate or oblong, adhering a little to the keel; keel incurved, obtuse or subacute. Upper stamen free to the base or middle; anthers uniform. Ovary sessile, uni- or bi- or multiovulate. Style upcurved, often flattened, naked or bearded; stigma terminal, penicillate or naked. Pod linear, rarely oblong or ovoid, flattened, two-valved, continuous or slightly septate within.—Undershrubs or herbs, the leaves usually pinnate, casually digitate or simple.

A large genus dispersed through the Tropics of both hemispheres; occurring also in South Africa, subtropical Australia, and North America.

* **Brissonia** (Neck.). Upper calyx-teeth at most only equalling the tube, deltoid or lanceolate. Pods many-seeded, in sp. 7 2-seeded. Leaves usually compound.

Leaves simple.
- Leaves linear, $\frac{1}{4}$–$\frac{3}{8}$ in. broad. Racemes reaching down amongst them . . . . . 1. *T. acaciæfolia.*
- Leaves lanceolate, $\frac{1}{2}$–$\frac{3}{4}$ in. broad. Racemes peduncled . . 2. *T. melanocalyx.*

Leaves digitate.
- Leaflets 3, rarely 1 . . . . . 3. *T. lævigata.*
- Leaflets 5–7, rarely 3 . . . . . 4. *T. lupinifolia.*

Leaves pinnately trifoliolate . . . . . 5. *T. sericea.*

Leaves pinnately multifoliolate
- Flowers 1–3 in the axils of the leaves; leaflets 2–3-jugate . 6. *T. emeroides.*
- Flowers in racemes; leaflets 4–10-jugate.
  - Diffuse slender annuals, with stems rarely exceeding a foot long.
    - Leaflets linear, $1\frac{1}{2}$–3 lines broad.
      - Seeds 2 . . . . . 7. *T. disperma.*
      - Seeds 4–5 . . . . . 8. *T. capillipes.*
    - Leaflets oblanceolate, 3–6 lines broad.
      - Pod glabrescent; seeds 8–9 . . . . . 9. *T. platycarpa.*
      - Pod downy; seeds 12–15.
        - Standard $\frac{1}{4}$ in. broad . . . . . 10. *T. humilis.*
        - Standard $\frac{1}{2}$ in. broad . . . . . 11. *T. nana.*

Shrubs, or tall robust usually perennial herbs.
- Bracts round or ovate acuminate.
  - Standard an inch broad . . . . . 12. *T. Vogelii.*
  - Standard $\frac{1}{2}$ inch broad.
    - Leaflets 5–7-jugate . . . . . 13. *T. dichroocarpa.*
    - Leaflets 12–13-jugate . . . . . 14. *T. elongata.*
- Bracts minute, linear or lanceolate.
  - Leaflets 4–7-jugate.
    - Racemes very short.
      - Racemes 3–4-flowered, lateral . . . . . 15. *T. fulvinervis.*

Racemes many-flowered, terminal, descending among the leaves . . . . . 16. *T. flexuosa.*
Racemes elongated, 6–12 in. long.
Pods 3–4-seeded . . . . . 17. *T. deflexa.*
Pods 8–12-seeded.
Leaflets $\frac{1}{4}$–$\frac{1}{2}$ in. broad, thinly grey-silky below.
Leaflets 12–14 lines long . . . . . 18. *T. noctiflora.*
Leaflets 3–4 in. long . . . . . 19. *T. rigidula..*
Leaflets under a line broad, argenteo-canescent below. 20. *T. concinna.*
Pods 15–20-seeded.
A strong annual . . . . . 21. *T. barbigera.*
Shrubby . . . . . 22. *T. polysperma.*
Leaflets 6–10-jugate.
Leaflets rounded at the base . . . . . 23. *T. æquilata.*
Leaflets narrowed at the base.
Shrubs.
Pod persistent densely velvety . . . . . 24. *T. densiflora.*
Pod glabrescent.
Seeds 8–10.
Leaflets 4–5 times as long as broad . . . . . 25. *T. rigida.*
Leaflets $2\frac{1}{2}$–3 times as long as broad . . . . 26. *T. oxygona.*
Seeds 16–18.
Leaflets $\frac{3}{4}$–1 in. long . . . . . 27. *T. Kirkii.*
Leaflets 3–4 in. long . . . . . 28. *T. secunda.*
Robust annuals or biennials.
Seeds 7–8 . . . . . 29. *T. Ansellii.*
Seeds 14–16 . . . . . 30. *T. bracteolata.*

** **Reineria** (Mœnch). Upper calyx-teeth linear or subulate, at least as long as the tube. Pods many-seeded. Leaves usually compound.

Leaves all simple . . . . . 31. *T. andongensis.*
Leaves simple and trifoliolate intermixed . . . . . 32. *T. dimorphophylla.*
Leaves pinnately tri- or multifoliolate.
Flowers 1–3 together, all in the axils of the leaves.
Slender annual, with glabrous pod . . . . . 33. *T. pedicellata.*
Diffuse firm perennials, with finely grey-downy pods.
Pod 12–15 lines long, 6–9-seeded.
Leaflets obovate-oblong, 4–6 lines long . . . . . 34. *T. vicioides.*
Leaflets oblanceolate, 9–18 lines long . . . . . 35. *T. subtriflora.*
Pod 2–$2\frac{1}{2}$ in. long, 10–12-seeded . . . . . 36. *T. anthylloides.*
Suffruticose, with densely velvety pods . . . . . 37. *T. elegans.*
Flowers in dense terminal heads.
Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long; corolla $\frac{3}{4}$–$\frac{7}{8}$ in. long . . . . . 38. *T. dasyphylla.*
Petioles 1–$1\frac{1}{2}$ lines long; corolla $\frac{1}{2}$–$\frac{5}{8}$ in. long . . . . . 39. *T. cephalantha.*
Flowers in elongated racemes.
Leaflets narrow-linear, 1–2 lines broad.
Low diffuse annual, with leaves the same colour on both sides . . . . . 40. *T. gracilipes.*
Tall slender perennials, with leaves canescent beneath.
Leaves thinly grey-canescent . . . . . 41. *T. linearis.*
Leaves persistently argenteo-canescent.
Side-leaflets 6–9 lines long . . . . . 42. *T. pulchella.*
Side-leaflets 12–18 lines long . . . . . 43. *T. longipes.*
Leaflets oblanceolate or oblanceolate-oblong, 3–6 lines broad.
Corolla large, $\frac{1}{2}$–$\frac{3}{4}$ in. long.
Pod oblong, 2–3-seeded . . . . . 44. *T. radicans.*

Pod linear, many-seeded.
Style bearded along inner edge.
Racemes close, few-flowered . . . . . 45. *T. huillensis.*
Racemes elongated, many-flowered . . . . . 46. *T. reptans.*
Style glabrous, faintly penicillate at the point.
Leaflets 3–7, densely pubescent beneath . . . 47. *T. paniculata.*
Leaflets 9–11, thinly grey-silky beneath . . . 48. *T. brunnea.*
Corolla small, $\frac{1}{4}$–$\frac{3}{8}$, or at most half an inch long.
Pod persistently velvety.
Pubescence of stem thin and adpressed . . . . 49. *T. villosa.*
Pubescence of stem dense and spreading.
Racemes 6–12 in. long; lower flowers in fascicles of 3–4 . . . . . 50. *T. incana.*
Racemes short, all lateral, distinctly stalked . 51. *T. coronilloides.*
Racemes short, mostly terminal, stalked or sessile . . . . . 52. *T. decora.*
Pod at first slightly downy, finally glabrescent.
Pod $\frac{3}{4}$–1 in. long, much recurved, 4–6-seeded . . 53. *T. drepanocarpa.*
Pod $1\frac{1}{2}$–2 in. long, slightly recurved, 6–9-seeded.
Leaflets 5–9 . . . . . 54. *T. Apollinea.*
Leaflets 13–17 . . . . . 55. *T. purpurea.*

*** **Pogonostigma** (Boiss.). Pods 1-seeded. Leaves compound.
The only species . . . . . 56. *T. nubica.*

**** **Requienia** (DC.). Pods 1-seeded. Leaves simple.
Pods and leaves beneath finely downy . . . . . 57 *T. sphærosperma.*
Pods and leaves beneath densely villose . . . . . 58. *T. obcordata.*

1. **T. acaciæfolia,** *Welw. mss.* An erect undershrub, 3–4 ft. high, with several ascending densely grey-downy branches from the upper part. Stipules linear-setaceous, 1–$1\frac{1}{2}$ lines. Leaves subsessile, linear, ascending, 4–5 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, rigidly coriaceous, bluntish with a mucro, grey glaucous green, upper surface glabrous, lower densely downy, the midrib ferruginous. Racemes reaching down amongst the leaves, sometimes a foot long, lax, most of the flowers in pairs. Pedicels very short, densely downy. Bracts setaceous, very minute. Calyx $\frac{1}{8}$ in., densely brown-silky, the upper teeth deltoid acuminate shorter than the tube, the lower lanceolate, equalling it. Corolla $\frac{3}{8}$ in. long, reddish, the standard $\frac{3}{8}$ in. broad, densely brown-silky on the back. Pod linear, densely silky, 10–12-seeded, not seen mature. Style penicillate at the point.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*
Very near a Madagascar plant, Lyall, 372, but apparently distinct specifically.

2. **T. melanocalyx,** *Welw. mss.* Root thick perennial. Stems spreading from it in a circle, ascending outwards, copiously branched, firm, slender, inconspicuously grey-silky. Petioles under a line long. Stipules minute setaceous. Leaves simple, lanceolate, 2–3 in. long, 6–9 lines broad, bluntish with a mucro, narrowed at the base, rigidly coriaceous, both sides pale glaucous green, upper quite, lower nearly glabrous. Racemes terminal only, peduncled, reaching 6–9 in. long, lax downwards, most of the flowers in pairs. Pedicels very short densely silky. Bracts linear, very minute. Calyx $\frac{1}{8}$ in. long, densely

matted with nearly black silky hairs; all the teeth lanceolate, equalling the tube. Corolla bright red, $\frac{1}{2}$ in. long; the obcordate standard densely silky on the outside. Pod linear, densely silky, 15–18 lines long whilst still immature, 8–10-seeded. Style densely penicillate at the apex.

Lower Guinea. Highlands of Huilla, Angola, *Dr. Welwitsch!*

3. **T. lævigata,** *Welw. mss.* A very diffuse nearly glabrous perennial, with very slender copiously branched stems 12–18 in. long. Bracts lanceolate acuminate, 1–1$\frac{1}{2}$ lines. Petioles 3–6 lines. Leaflets 3 (of the uppermost leaves rarely solitary), subsessile but stipellate, oblanceolate, 12–18 lines long, 4–5 lines broad, blunt with a mucro, sometimes emarginate, rigidly coriaceous, glabrous, pale green with a very distinct thickened grey horny border and ribs. Racemes copious, both terminal and leaf-opposed, reaching 6–9 in. long, leafy at the very base. Bracts lanceolate, very minute. Pedicels 1–3 lines, ascending, spreading or even deflexed. Calyx $\frac{1}{8}$ in., obscurely grey-silky; all the teeth lanceolate, equalling the tube. Corolla reddish, twice the calyx. Pod linear, an inch long, 2 lines broad, faintly grey-downy, 5–6-seeded.

Lower Guinea. Highlands of Huilla province, Angola, *Dr. Welwitsch!*

4. **T. lupinifolia,** *DC. Prod.* ii. 255. A wide-trailing perennial herb with slender branches densely clothed with spreading grey or brownish pubescence. Stipules 2–3 lines, lanceolate acuminate. Petioles 1–5 in., densely pubescent. Leaves digitate but stipellate, casually imparipinnate. Leaflets 5–7, rarely 3, narrow-oblanceolate, 18–24 lines long, 3–6 lines broad, bluntish, mucronate and often emarginate, rigidly coriaceous, grey-green, glabrous above, densely downy beneath. Racemes both terminal and leaf-opposed, very lax, reaching a foot long. Bracts minute lanceolate. Pedicels 1–1$\frac{1}{2}$ lines. Calyx $\frac{1}{8}$ in., the lanceolate acuminate teeth equalling the tube. Corolla reddish, twice the calyx. Pods linear, downy, 12–15 lines long, 2 lines broad, 5–6-seeded, sometimes much shortened, oblong, not more than 1–2-seeded.—Harv. Fl. Cap. ii. 204. *Rhynchosia Cienkowskii*, Schweinf. Rel. Kots. 31, t. 24–25 (the form with the half-aborted pods).

Upper Guinea. Senegambia, *Perrottet!* Nupe and by the Quorra at Jeba, *Barter!*
Nile Land. Kordofan, *Cienkowski.*
Lower Guinea. Congo, in the sands of the seashore, *Dr. Welwitsch!*

Var. β. *T. digitata*, DC. Prod. loc. cit.
Stems more slender, less downy. Leaflets narrower, subglabrescent.
Upper Guinea. Senegambia, *Bacle! Bidjem! Perrottet!*
Lower Guinea. Loanda, *Dr. Welwitsch!*
Extends to the Cape.

5. **T. sericea,** *Baker.* Stem erect, tall, firm-herbaceous, densely clothed with short spreading grey pubescence. Petioles 1$\frac{1}{2}$–2 in. long, densely silky. Leaflets 3, not fully developed in the specimens, nar-

rowly lanceolate, 12–18 lines long by 3–4 lines broad, narrowed gradually to an acute point, stipellate, the central one on a petiolule 6–8 lines long, both sides densely silky, the veins subferruginous. Flowers 20–30 or more in a terminal raceme 6–12 in. long, the lower ones in clusters. Pedicel 1–1½ lines long, densely grey-silky. Calyx-tube campanulate, 2 lines deep, densely clothed with grey and pale brown silky hairs, the lower teeth lanceolate, equalling the tube, the upper ones deltoid, considerably shorter. Bracts minute, deciduous, subulate. Corolla red, ⅝ in. deep, the standard ½ in. broad, the young pod linear, densely grey-villous, 10-12-ovulate, the style flattened in the lower half, the stigma penicillate.

Mozamb. Distr. Manganya hills, *H. Waller!*

6. **T. emeroides,** *A. Rich. Fl. Abyss.* i. 190. Stems woody, the branches firm, angular, thinly grey-silky. Stipules setaceous, ⅛ in. long. Leaves nearly sessile, the rachis under an inch long, the leaflets in 2 or 3 pairs, narrowly oblanceolate, ¾ in. long, ¼–⅜ in. broad, glabrous above, thinly adpressed grey-silky beneath. Flowers 1–3 in the axils of the leaves. Pedicels equalling the calyx, which is 2 lines deep, campanulate, thinly silky, the teeth subequal, lanceolate-deltoid, reaching halfway down. Corolla yellow. Pod 1½–2 in. long, 2 lines broad, slightly arcuate, densely clothed with fine short ferruginous tomentum, 10-seeded.

Nile Land. Abyssinia, *Petit!*
General habit and leaves very like those of *T. purpurea.*

7. **T. disperma,** *Welw. mss.* A diffuse prostrate annual with copiously branched finely grey-downy stems under a foot long. Stipules linear, very minute. Petioles 2–3 lines. Leaflets 7–9, narrowly oblanceolate, on a common rachis 6–9 lines long, the terminal one 12–18 lines long, 2–3 lines broad, blunt with a mucro, the side ones much shorter, texture not rigid, both sides grey-green, the under one finely grey-downy, the veins inconspicuous. Racemes very lax (internodes often an inch long) both terminal and leaf-opposed, reaching 6–9 in. long, the lowest pair of flowers often from the axil of a leaf. Bracts setaceous, very minute. Pedicels very slender, 1½–3 lines long, often spreading or deflexed. Calyx ⅛ in. long, finely grey-silky, the lanceolate teeth shorter than the tube. Corolla purplish, fugacious, half as long again as the calyx. Pod ½ in. long, 2 lines broad, finely grey-downy, 2-, rarely 1-seeded, the upper suture straight. Style glabrous.

Lower Guinea. Mossamedes, Benguela, in coast sands, *Dr. Welwitsch!*

8. **T. capillipes,** *Welw. mss.* A slender copiously branched diffuse annual with ascending stems a foot or more long with a little fine grey pubescence. Stipules setaceous, very minute. Leaves nearly sessile, rachis 1–2½ in. long; leaflets 9–17, linear, reaching 1½–2 in. long, 1–3 lines broad, bluntish or subacute with a distinct mucro, thin for the

genus, with a little adpressed shining grey-silky pubescence beneath. Racemes copious, very lax, terminal and leaf-opposed, reaching 6–9 in. long, the lowest pair of flowers often from the axil of a leaf. Pedicels finely downy, very slender, reaching 4–6 lines long, often spreading or decurved. Calyx 1 line long, with a little adpressed grey pubescence, the lanceolate teeth much shorter than the tube. Corolla rose-purple, more than twice the calyx. Pod linear, 9–10 lines long, $\frac{1}{8}$ in. broad, finely grey-downy, much upcurved, 4–5-seeded. Style glabrous.

Lower Guinea. Loanda, frequent in dry grassy places, *Dr. Welwitsch!*
General habit like that of *T. gracilipes*.

9. **T. platycarpa,** *Guill. et Perr. Fl. Seneg.* 195. Stems firm-herbaceous, branched from the base, 1–1½ ft. high, the branches ascending, slender, thinly adpressed-silky. Stipules ¼ in. long, linear-subulate. Leaves subsessile, the rachis 3 in. long, the leaflets in 5–6 pairs, linear, 1½–2 in. long, 2–3 lines broad, apex rounded, mucronate, upper surface glabrous, lower thinly adpressed-silky. Racemes leaf-opposed, sessile, 6–12-flowered, moderately dense. Bracts linear, equalling the pedicel and calyx, which is 2 lines deep, thinly silky, the lower tooth lanceolate, reaching halfway down, the others shorter. Corolla not seen. Pod linear-oblong, 1½ in. long, 4 lines broad, straight, subglabrous, 8–9-seeded.

Upper Guinea. Senegambia, *Perrottet! Ingram! Bidjem.*

10. **T. humilis,** *Guill. et Perr. Fl. Seneg.* 196. Stems annual, under a foot high, branched from the base, the branches ascending, slender, finely grey-silky. Petioles 1 in. or more long, the rachis 2–3 in., leaflets in 4 or 5 pairs, 1–1½ in. long, ¼ in. broad, upper surface glabrous, lower finely grey-silky, apex rounded, mucronate. Racemes leaf-opposed, subsessile, densely 6–12-flowered. Bracts linear-subulate, ⅜ in. long. Calyx 2 lines deep, thinly silky, the teeth unequal, the lowest linear reaching halfway down, the others shorter. Corolla rose, ½ in. deep, the standard ¼ in. broad. Pod linear, slightly upcurved, 1½–2 in. long, 2 lines broad, silky, 12–14-seeded.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*

11. **T. nana,** *Kotschy; Schweinf. in Rel. Kots.* xvi. t. 20. Stem annual, not more than a foot high, copiously branched from the base, the branches slender, ascending, angular, moderately thickly clothed with spreading grey silky hairs. Stipules linear, ¼ in. long. Leaves short-stalked, the rachis 1–4 in. long. Leaflets in 4–5 pairs, oblanceolate, 1–2 in. long, ½–⅝ in. broad, apex rounded, emarginate, mucronate, upper surface glabrous, the lower finely villous. Racemes leaf-opposed, densely 6–12-flowered, on short peduncles. Bracts linear, ¼–⅜ in. long. Pedicels densely villous, equalling the calyx, which is campanulate, ⅛ in. deep, the lowest tooth lanceolate equalling the tube, the others deltoid. Corolla purple, half an inch long, the standard half an

inch broad, silky on the back. Young pod linear, falcate, densely silky, 12–15-seeded.

Nile Land. Abyssinia, *Schweinfurth!*

Var. β. *angolensis*, Baker.

Stems and leaves beneath densely downy. Pods 2–2½ in. long, ¼ in. broad, straight, finely downy.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

12. **T. Vogelii,** *Hook. f. Fl. Nigr.* 296. A shrub 8–10 ft. high, the branches woody, ascending, clothed with dense spreading ferruginous or yellowish silky tomentum. Stipules linear, ¼–⅜ in. long. Leaves short-stalked, the rachis 5–6 inches long. Leaflets in 8–12 pairs, oblanceolate, 1½–2½ in. long, ½–¾ in. broad, apex rounded mucronate, upper surface subglabrous, the lower densely clothed with adpressed grey silky pubescence, the midrib ferruginous. Flowers in dense stalked terminal racemes, the main one 20–30-flowered, 4–6 in. long. Pedicels ¼–½ in. long, very silky. Bracts roundish or ovate-acuminate, densely silky, ⅜ in. broad, quite hiding the buds. Calyx ⅜–½ in. deep, densely clothed with light or dark brown silky tomentum, the teeth reaching halfway down, oblong-lanceolate, the lowest longer than the others. Corolla violet-purple, rarely white, nearly an inch deep, the standard an inch broad, silky on the back. Pods straight or slightly upcurved, 4–5 in. long, ½ in. broad, densely grey or brown velvety, 16–18-seeded. Style bearded at the apex and down the inner face.

Upper Guinea. Guinea proper, *Vogel!* and others. Sierra Leone, *Afzelius!* Fernando Po, *Vogel! Ansell!* Princes island, cultivated, *Mann!*

Nile Land. Unyoro, *Speke and Grant!*

Lower Guinea. Golungo Alto, and Pungo Andongo, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Kirk!* Zanzibar, *Boivin* (*fide Baillon*).

Much the largest and most showy species, and often used, like the allied *T. toxicaria* in America, for the purpose of throwing into ponds to stupefy fish. Called Igongo on the Gaboon.

13. **T. dichroocarpa,** *Steud. in Schimp. Hb. Abyss.* No. 102. A woody erect undershrub 4–5 ft. high, with firm ascending angular thinly adpressed-grey-silky branches. Stipules linear, ⅜ in. long. Leaves short-stalked, the rachis 2–4 in. long, the leaflets in 5–7 pairs, oblanceolate, 1–1½ in. long, ⅜–½ in. broad, apex truncate or emarginate, both sides subglabrous when mature. Racemes terminal, the main ones 6–9 in. long, sessile or long- or short-stalked, the flowers in distant clusters of 4–6 each. Bracts roundish or ovate, ¼ in. broad, densely silky. Pedicels equalling the calyx, which is ¼–⅜ in. deep, densely clothed with ferruginous silky hairs, the lowest teeth lanceolate, reaching half way down, the others shorter, subdeltoid. Corolla reddish, ¾ in. deep, standard ½ in. broad, very silky on the back. Pod 2 in. or more long, ¼ in. broad, densely and persistently finely silky, 9–10-seeded.—*T. interrupta*, Hochst. et Steud. in Schimp. Hb. Abyss. No. 344.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit! Roth!*

Also a plant of Madagascar.

14. **T. elongata,** *Hook. f. Fl. Nigr.* 298. An erect undershrub about 3 ft. high, the branches firm, ascending, finely adpressed grey-silky. Stipules lanceolate, $\frac{1}{4}$ in. long. Leaves nearly sessile, the rachis 6–9 in. long, the leaflets in about 12 pairs, linear, $1\frac{1}{2}$–3 in. long, 2–3 lines broad, apex rounded mucronate, upper surface glabrous, under finely adpressed-grey-silky, midrib ferruginous. Racemes long-stalked, terminal, 6–12 in. long, the lower part lax. Bracts ovate-oblong, acuminate, $\frac{1}{4}$ in. long, ciliated and silky on the back. Pedicels very silky, shorter than the calyx, which is campanulate, 2–3 lines deep, the lower tooth lanceolate, about equalling the tube, the others short, deltoid. Corolla reddish, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, the standard $\frac{1}{2}$ in. broad, silky on the back. Pod 2–3 in. long, $\frac{1}{4}$ in. broad, nearly straight, thinly clothed with tawny silky hairs, 12–14-seeded.

Upper Guinea. Common on the banks of the Quorra, *Vogel! Barter!*

T. fasciculata of the Niger Flora, appears to be a variety of the same plant, with an abbreviated raceme.

15. **T. fulvinervis,** *Hochst. in Schimp. Hb. Abyss.* No. 1939. Stem 2–3 ft. high, terete, striated, tawny-silky. Leaflets in 4–6 pairs, linear, $1\frac{1}{2}$–2 in. long, 2–3 lines broad, apex rounded mucronate rarely narrowed, upper surface subglabrous, lower adpressed silky, the midrib tawny. Flowers 3–4, distant, short-stalked, peduncle lateral, 3–4 in. long, tawny-silky. Calyx short, tawny-silky, teeth short, unequal, the lowest the longest. Pod 2 in. long, scarcely 3 lines broad, silky.—A. Rich. Fl. Abyss. i. 187.

Nile Land. Kordofan, *teste Schweinfurth.* Abyssinia, *Schimper, Quartin-Dillon.*

This we have not seen. It is said by A. Richard to differ from *T. bracteolata* by its shorter and lateral peduncles, with fewer flowers, and fewer leaflets, which are more silky beneath.

16. **T. flexuosa,** *G. Don, Gard. Dict.* ii. 232. Stem woody, erect, a foot high, the branches firm, copious, densely tawny-silky. Stipules filiform. Petiole $\frac{1}{2}$ in. long, clothed like the branches. Leaflets 4–5, linear, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, 2–$2\frac{1}{2}$ lines broad, apex rounded, mucronate, texture firm, upper surface subglabrous, lower densely silky. Flowers in a short terminal raceme, with scattered flowers continued down in the axils of the leaves. Bracts subulate. Calyx campanulate, $\frac{1}{8}$ in. deep, densely silky, the teeth deltoid-acuminate, reaching about half down. Corolla reddish, 4–5 lines deep, the standard densely silky on the outside. Pod linear-oblong, $1\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, straight, thinly silky when mature, 7–8-seeded.—Hook. f. Fl. Nigr. 299.

Upper Guinea. Island of St. Thomas, *G. Don!*

17. **T. deflexa,** *Baker.* A woody erect undershrub, with firm, ascending sulcate, thinly adpressed-silky branches. Stipules $\frac{1}{2}$ in. long, linear-subulate. Leaves conspicuously deflexed, the petioles very short, the rachis 3–4 in. long, the leaflets in 4–5 pairs, narrowly oblanceolate. 2–$2\frac{1}{2}$ in. long, $\frac{1}{2}$ in. broad, the lower ones much shorter, emarginate,

upper surface glabrous, lower thinly adpressed-grey-silky. Flowers in rather dense terminal racemes, the main ones ultimately nearly a foot long, sessile. Bracts linear, half an inch long. Pedicels about equalling the calyx, which is campanulate, thinly silky, 2 lines deep, the lower tooth lanceolate, reaching halfway down, the others deltoid. Corolla not seen. Pod deflexed, $1\frac{1}{4}$ in. long, 2 lines broad, nearly straight, subglabrous, 3–4-seeded.

Upper Guinea. Senegambia, *Heudelot!*

18. **T. noctiflora,** *Bojer, Hort. Maur.* 93 (name only). Stems suffruticose, copiously and diffusely branched, densely clothed upwards with fine short brown silky pubescence. Stipules linear-subulate, $\frac{3}{8}$ in. long. Leaves subsessile, rachis 3–4 in. long, leaflets in 6–8 pairs, narrowly oblanceolate, 12–14 lines long, $\frac{1}{4}$ in. broad, glabrous above, thinly adpressed grey-silky beneath, apex rounded, mucronate. Racemes lax, terminal, the main one sometimes a foot long. Bracts lanceolate, very short. Pedicel equalling the calyx, which is densely clothed with ferruginous silky hairs, 2 lines deep, the lower tooth lanceolate, equalling the tube, the others shorter and deltoid. Corolla $\frac{3}{8}$–$\frac{1}{2}$ in. deep, reddish, the standard $\frac{1}{4}$ in. broad, silky on the back. Pod $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad, curved upwards, densely clothed with fine brown silky hairs, 8–9-seeded.

Mozamb. Distr. Island of Zanzibar, *Bojer!*
In general habit considerably resembling *T. purpurea.*

19. **T. rigidula,** *Welw. mss.* An almost glabrous suffruticose perennial, several feet high, with erect or oblique firm flexuose stems with long internodes. Stipules linear, 2–3 lines. Petioles 6–18 lines, rachis 2–3 in., leaflets 7–9, linear, reaching 3–4 in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, blunt, mucronate, glabrous above, faintly silky beneath, subrigid, veins immersed. Racemes copious, both terminal and lateral, peduncled, lax, reaching 6–9 in. Bracts rigid, linear-subulate, $\frac{1}{8}$ in. Pedicels 1–4 lines, finely grey-silky. Calyx 2 lines, campanulate, finely grey-silky, teeth deltoid, very short. Corolla $\frac{1}{8}$–$\frac{5}{8}$ in., purplish-violet, standard $\frac{1}{2}$ in. broad, glabrescent on the back. Pod linear, slightly upcurved, 3–$3\frac{1}{4}$ in. long, 2 lines broad, glabrescent, 11–12-seeded. Style pubescent throughout.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

20. **T. concinna,** *Baker.* Stems shrubby, slender, finely grey-downy. Stipules linear-subulate, 2–3 lines. Petioles 0 or very short. Leaflets 7–13, narrow-linear, reaching $1\frac{1}{2}$–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ line broad, rigidly coriaceous, acute with a mucro, grey and glabrous above, persistently argenteo-canescent below. Racemes terminal, stalked or subsessile, reaching a foot long. Bracts lanceolate, $1\frac{1}{2}$–2 lines. Pedicels grey-downy, erecto-patent, 1–3 lines. Calyx $\frac{1}{8}$ in., finely grey-downy, upper teeth deltoid, lower lanceolate, as long as the tube. Corolla bright reddish-purple, $\frac{1}{2}$ in. long, standard $\frac{1}{2}$ in. broad, densely grey-

silky on the back. Pod linear, 2 in. long, 2 lines broad, slightly recurved, glabrescent, 10–12-seeded. Style pubescent throughout, bearded along the inner edge.

Upper Guinea. Banks of the Niger, *Dr. Baikie!*

21. **T. barbigera,** *Welw. mss.* An erect robust annual, 2–4 ft. high, with flexuose stems, densely clothed with spreading tawny pubescence. Stipules 3–6 lines, linear or lanceolate acuminate. Petioles 6–12 lines; rachis 2–4 inches; leaflets 11–15, narrowly oblanceolate, $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, 5–7 lines broad, blunt, mucronate, often emarginate, grey-green, glabrescent above, permanently grey-silky below, the midrib and border tawny. Racemes usually terminal, long-stalked, close upwards, reaching 4–6 in. long, rarely a pair of flowers from the axil of the top leaf. Bracts linear, 2–3 lines. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., erecto-patent. Calyx $\frac{1}{8}$ in. long, obliquely campanulate, very densely clothed with rather stiff spreading tawny hairs, the upper teeth short deltoid, the lowest lanceolate, twice as long. Corolla purplish violet, $\frac{1}{2}$–$\frac{5}{8}$ in. long, standard 4–5 lines broad, densely brown-silky on the back. Pod linear, slightly falcate, 2 in. long, 2–$2\frac{1}{2}$ lines broad, finely grey-downy, 15–16-seeded. Style bearded throughout, especially along the upper side.

Lower Guinea. Golungo Alto and Pungo Andongo, Angola, *Dr. Welwitsch!*

22. **T. polysperma,** *Baker.* An erect suffruticose perennial, with stems densely clothed with spreading tawny pubescence. Stipules linear, 4–6 lines. Petioles 1 in.; rachis 3–4 inches; leaflets 11–13, narrowly oblanceolate, $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, 5–6 lines broad, blunt, mucronate, subcoriaceous, glabrescent above, persistently grey-silky below, the midrib tawny. Racemes terminal and lateral, peduncled, reaching 6–9 in. long. Bracts linear, $\frac{1}{4}$ inch. Pedicels densely silky, $1\frac{1}{2}$ 2 lines, erecto-patent. Calyx 2 lines, finely silky, the upper teeth deltoid, the lowest lanceolate, $\frac{1}{3}$–$\frac{1}{2}$ the tube. Corolla reddish, $\frac{5}{8}$ in. long, the standard $\frac{1}{2}$ in. broad, densely velvety on the back. Pod linear, slightly falcate, $2\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, finely downy, 18–20-seeded. Style flattened upwards, slightly downy.

Nile Land. Uganda, in plantain groves, *Speke and Grant!*

23. **T. æquilata,** *Baker.* Stems woody, the branches firm, subterete, densely clothed upwards with spreading grey-silky hairs. Stipules lanceolate, silky, soon scarious, $\frac{1}{4}$ in. long, half as broad. Leaves subsessile, the densely silky rachis 3 in. long; leaflets in 7–8 pairs, linear-oblong, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, 4–5 lines broad, sides nearly parallel, apex and base rounded, upper surface pale green, glabrous, lower densely clothed with short grey-silky hairs. Racemes subsessile, terminal, dense, about 12-flowered. Bracts small, linear. Pedicel equalling the calyx, which is densely clothed with tawny silky hairs, 3–4 lines deep, the lower teeth lanceolate, reaching halfway down, the upper rather broader and shorter. Corolla reddish, twice as long as the calyx, the

standard half an inch broad. Pod straight, 1¼ in. long, ¼ in. broad, clothed with fine tawny silky pubescence, 6-seeded.

Nile Land. Karague hills, *Speke and Grant* 401!

This may be distinguished from all the other species by the shape of the leaflets, which are distinctly rounded at the base, and less prominently veined than usual.

24. **T. densiflora,** *Hook. f. Fl. Nigr.* 296. A woody undershrub several feet high, with stiff sulcate ascending finely grey-pubescent branches. Stipules ¼ in. long, lanceolate. Leaves nearly sessile, the rachis 4–5 in. long; leaflets in 7–9 pairs, oblong-obovate, 1¼–1½ in. long, ½–¾ in. broad, point distinctly emarginate, upper surface subglabrous, lower adpressed grey-silky. Racemes dense, terminal, short-stalked, 3–4 in. long. Bracts linear-lanceolate, like the pedicels about equalling the calyx, which is campanulate, 2–3 lines deep, densely coated with spreading grey-silky hairs, the lower tooth lanceolate equalling the tube, the others deltoid, shorter. Corolla reddish, ¾ in. deep, the standard ¾ in. broad, densely silky on the back. Pod 3–4 in. long, under ½ in. broad, nearly straight, densely clothed with short grey woolly pubescence, the valves ferruginous.

Upper Guinea. Banks of the Quorra, *Vogel! Barter!*

25. **T. rigida,** *Baker.* A woody erect undershrub with rigid ascending subglabrous branches. Stipules linear, rigid, deciduous, ¼ in. long. Leaves subsessile, the rachis rigid, 2 in. or more long, leaflets in 6–8 pairs, linear, 1–1¼ in. long, ¼ in. broad, pale green and glabrous above, glaucous and slightly argenteous beneath, especially when young, base narrowed, apex rounded mucronate, coriaceous, the veins beneath close and very prominent. Racemes terminal, dense, short-stalked, 2–4 in. long. Bracts linear, ¼ in. long, and pedicels about the same. Calyx campanulate, finely silky, 2 lines deep, the lowest tooth lanceolate, a line long, the others short and deltoid. Corolla pale-reddish, ⅝ in. deep, standard ⅜ in. broad, very silky on the back. Pod 2 in. or rather more long, ¼ in. broad, slightly upcurved, subglabrous, 9–10-seeded.

Nile Land. Madi, *Speke and Grant!*

26. **T. oxygona,** *Welw. mss.* An erect copiously branched undershrub 3–4 ft. high, with argenteo-canescent firm terete branches. Stipules ⅛ in., linear, rigid, deciduous. Petioles 6–12 lines; leaflets 13–19, obovate-oblong, reaching 12–15 lines long, 5–6 lines broad, rigidly coriaceous, blunt, emarginate, mucronate, both sides persistently canescent, upper grey, lower glaucous, the tawny veins slightly raised. Racemes both lateral and terminal very lax, 6–12 in. long, stalked, the canescent axis acute-angled. Bracts linear, rigid, 1–1½ lines. Pedicels 1–2 lines, silvery, erecto-patent. Calyx campanulate, 2–2½ lines, the upper teeth deltoid-cuspidate, the lowest lanceolate, all shorter than the tube. Corolla violet-purple, 7–8 lines long, standard ½ in. broad, much recurved, silvery on the outside. Pod linear, 2–2½ in. long, 2½

lines broad, glabrescent, much recurved, 8–10-seeded. Style glabrous, slightly penicillate at the apex.

Lower Guinea. Mossamedes, Benguela, in sandy ground near the Bero, *Dr. Welwitsch!*

27. **T. Kirkii,** *Baker.* Stems shrubby, slender, flexuose, with a few inconspicuous adpressed grey hairs. Stipules linear, $\frac{1}{4}$–$\frac{3}{8}$ in. Petioles 3–4 lines; rachis $2\frac{1}{2}$–$3\frac{1}{2}$ in.; leaflets 15–17, oblanceolate, 9–12 lines long, 3–4 lines broad, blunt, emarginate, mucronate, rigidly coriaceous, grey and glabrous above, glaucous and thinly clothed with adpressed grey hairs below, the fine veins slightly raised. Racemes terminal, long-stalked, moderately lax, reaching 6–9 in. long, the axis acute-angled and sulcate. Bracts linear-subulate, $1\frac{1}{2}$–2 lines. Pedicels downy, ascending, 1–3 lines. Calyx 2 lines, finely downy, the upper teeth lanceolate-deltoid, the lowest lanceolate, as long as the tube. Corolla purplish-violet, $\frac{5}{8}$ in. long; standard $\frac{1}{2}$ in. broad, densely silky on the back. Pod linear, $2\frac{1}{2}$ in. long, 2 lines broad, slightly recurved, glabrescent, 16–18-seeded. Style subterete, finely pubescent throughout.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

28. **T. secunda,** *Welw. mss.* An erect shrub 3–4 ft. high, with strong glabrous flexuose branches. Stipules linear, $\frac{1}{4}$–$\frac{3}{8}$ in. Petioles 6–18 lines; leaflets 13–19, linear, reaching 3–4 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, bluntish, distinctly mucronate, upper surface grey glabrescent, lower glaucous, faintly grey-silky, the veins fine raised. Racemes copious, terminal and lateral, peduncled, reaching a foot long, very lax, subsecund, the axis acute-angled sulcate. Bracts linear, 1–$1\frac{1}{2}$ lines. Pedicels 1–3 lines, erecto-patent. Calyx 2 lines, finely silvery, the teeth lanceolate, shorter than the tube. Corolla purplish, $\frac{3}{4}$ in. long, standard $\frac{5}{8}$–$\frac{3}{4}$ in. broad, grey-silky on the outside. Pod linear, 3–$3\frac{1}{2}$ in. long, $2\frac{1}{2}$ lines broad, glabrescent, nearly straight, 16–18-seeded. Style faintly pubescent throughout.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

29. **T. Anselliі,** *Hook. f. Fl. Nigr.* 297. A robust annual reaching 3 ft. high, with copious firm flexuose branches densely clothed with spreading grey or ferruginous silky pubescence. Stipules linear-subulate, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaves nearly sessile, rachis 4–5 in. long; leaflets in 6–9 pairs, linear or oblanceolate, $\frac{1}{4}$–$\frac{3}{4}$ in. broad, truncate or emarginate with a mucro, upper surface glabrous, lower densely clothed with grey silky pubescence, midrib ferruginous. Flowers in lax terminal racemes sometimes a foot long, usually sessile, sometimes with flowers from the axils of the leaves. Bracts linear, $\frac{1}{4}$ in. long. Pedicel equalling the calyx, which is densely ferruginous-silky, 2 lines deep, campanulate, the lower tooth lanceolate, about equalling the tube, the others deltoid, shorter. Corolla reddish, $\frac{1}{2}$ in. deep, the standard 4 lines broad, densely brown-silky on the back. Pod linear-oblong,

1½–2 in. long, rather over ¼ in. broad, thinly brown-silky, 7–8-seeded. Style bearded along the upper side.

Upper Guinea. Niger country, *Ansell! Irving! Vogel!* and others.

30. **T. bracteolata,** *Guill. et Perr. Fl. Seneg.* 194. An erect robust annual or biennial, 2–3 ft. high, the branches ascending, long, straight, slender, thinly adpressed-silky. Stipules lanceolate acuminate, ¼–⅜ in. long. Leaves nearly sessile, the rachis 4–6 in. long; leaflets in 6–10 pairs, linear or oblanceolate, 2–3 in. long, ¼–½ in. broad, apex rounded, mucronate, upper surface glabrous, lower very slightly adpressed grey-silky. Flowers in lax terminal or leaf-opposed racemes, usually long-stalked, 6–20-flowered, 4–6 in. long. Bracts linear, rigid, equalling the pedicels which are 2–3 lines long. Calyx campanulate, 2 lines deep, thinly silky, the lowest tooth lanceolate, equalling the tube, the others deltoid and shorter. Corolla reddish, ½–⅝ in. deep, the standard ½ in. broad, thinly silky on the back. Pod 2–3 in. long, 2–3 lines broad, nearly straight, finely grey-silky, 14–16-seeded.—A. Rich. Fl. Abyss. i. 186. *T. Kotschyana,* Hochst. in Schimp. Hb. Abyss. No. 716.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*
Nile Land. Nubia, *Kotschy.* Abyssinia, *Schimper! Quartin-Dillon and Petit!*
Lower Guinea. Cazengo, *Dr. Welwitsch!*
Also a plant of the Cape Verde islands.

31. **T. andongensis,** *Welw. mss.* An erect undershrub 2–3 feet high, with ascending terete firm branches densely clothed with short spreading grey down. Stipules setaceous, 1–1½ lines. Petioles downy, ⅛–¼ inch. Leaves simple, oblanceolate-oblong, reaching 3–3½ in. long, 8–12 lines broad, blunt with a small mucro, subcoriaceous, above grey and glabrous, below shortly grey-pubescent, the veins raised and tawny. Racemes very copious, terminal and lateral, stalked or sessile, reaching 6–9 in. long, the acute-angled axis densely pubescent. Bracts lanceolate, 1 line. Pedicels 1–1½ lines, erecto-patent, densely grey-downy. Calyx 4 lines long, densely grey-downy; the teeth all exceeding the tube, the upper linear, lower lanceolate acuminate. Corolla purplish-red, ⅝ in. long; standard 4½–5 lines broad, densely velvety on the back. Ovary linear, densely grey-velvety, multiovulate. Style finally ⅜ in. long, flattened upwards, penicillate at the apex. Mature pod not seen.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*
A second species of § *Reineria,* with simple leaves, was gathered by Forbes at Delagoa Bay (*T. Forbesii,* Baker). A perennial, with shortly grey-downy, slender branches, subsessile, linear, rigid leaves, 1½–2 inches long; flowers solitary, or in pairs in their axils; calyx 2 lines long, with setaceous teeth exceeding the tube; corolla reddish, half as long again as the calyx.

32. **T. dimorphophylla,** *Welw. mss.* An erect herbaceous perennial 2–3 ft. high, with firm long slender branches densely clothed with short spreading grey pubescence. Stipules setaceous, 3–4 lines. Pe-

tioles 3–6 lines. Leaves pinnately trifoliolate with fewer simple ones intermixed, the end one oblong, reaching $2\frac{1}{2}$–3 in. long, 12–16 lines broad, blunt, sometimes emarginate, membranous, glabrous above, finely grey-downy below, base rounded. Racemes terminal, sessile or reaching down to the second leaf, 4–6 in. long, subdense upwards. Bracts $\frac{1}{8}$–$\frac{1}{4}$ in. long, setaceous. Pedicels $\frac{1}{2}$–$1\frac{1}{2}$ lines, erecto-patent. Calyx $\frac{3}{8}$ in. long, densely clothed with nearly black spreading silky hairs; teeth lanceolate cuspidate, exceeding the tube. Ovary linear, densely velvety, multiovulate. Style glabrous, flattened upwards, penicillate at the point. Ripe pod not seen.

Lower Guinea. Highlands of Huilla, Angola, in woody meadows, *Dr. Welwitsch!*

33. **T. pedicellata,** *Baker.* Stems annual, a foot or more long, diffusely branched, the branches slender, thickly clothed with fine spreading brownish silky hairs. Stipules lanceolate acuminate, $\frac{1}{4}$ in. long. Petioles often an inch long, the rachis 1–$1\frac{1}{2}$ in. long, slender; leaflets in 2–4 pairs, oblanceolate, $\frac{3}{4}$–1 in. long, 2–3 lines broad, the apex rounded and mucronate, upper surface glabrous, lower thinly clothed with loose silvery silky hairs. Flowers 1–3 in the axils of the leaves on slender pedicels 2–3 lines long. Calyx 2–3 lines deep, thinly silky; the teeth subequal, linear-subulate, reaching more than halfway down. Corolla reddish, twice as long as the calyx; the standard 2 lines broad. Pod 1–$1\frac{1}{4}$ in. long, $2\frac{1}{2}$ lines broad, slightly recurved, glabrous, 6–9-seeded.

Upper Guinea. Confluence of the Quorra and Tschadda, *Barter!*

34. **T. vicioides,** *A. Rich. Fl. Abyss.* i. 188. A herbaceous perennial with stems $1\frac{1}{2}$–2 ft. long, and diffusely branched, clothed with fine spreading grey pubescence. Stipules 2 lines long, linear, firm, falcate. Leaves subsessile, the villous rachis $1\frac{1}{2}$ in. long; leaflets in 3–4 pairs, obovate-oblong, $\frac{3}{8}$–$\frac{1}{2}$ in. long, three-quarters or the lower ones quite as broad as long; apex deeply emarginate; both surfaces finely adpressed-grey-silky. Flowers all axillary, solitary or two together. Pedicel equalling the calyx, which is 2 lines deep, very silky; the teeth lanceolate-subulate, reaching halfway down. Corolla purplish, twice as long as the calyx; the standard $\frac{1}{4}$ in. broad. Pod an inch long, rather over $\frac{1}{8}$ in. broad, slightly recurved, finely grey-downy, 8–9-seeded.

Nile Land. Nubia, *Ehrenberg, Kotschy!* Abyssinia, *Schimper, Quartin-Dillon.*

35. **T. subtriflora,** *Hochst. in Schimp. Hb. Abyss.* No. 2312. A herbaceous perennial, 1–$1\frac{1}{2}$ ft. high, dichotomously branched from the base, the branches firm, densely clothed with short spreading grey-silky hairs. Stipules setaceous, $\frac{1}{4}$ in. long. Petioles $\frac{1}{2}$–$\frac{3}{4}$ in. long, rachis $\frac{3}{4}$–1 in.; the leaflets in two or three pairs, narrowly oblanceolate, terminal one 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, the others smaller, upper surface glabrous, lower densely adpressed grey-silky. Flowers 1–3 in the axils of the leaves, nearly sessile; the calyx silky, $\frac{1}{8}$ in. deep; the teeth setaceous, equalling the tube. Corolla purple, half as long again

as the calyx, the standard 2 lines broad. Pod 12–15 lines long, $\frac{1}{8}$ in. broad, slightly recurved, finely downy, 6–7-seeded.—*T. decidua*, Steud., A. Rich. Fl. Abyss. i. 189?

Nile Land. Abyssinia, *Schimper!*

A. Richard's short description of *T. decidua* agrees with this as far as it goes, but we have not seen specimens.

36. **T. anthylloides**, *Hochst. in Kotsch. Hb. Æthiop.* No. 3. Stems suffruticose, $1\frac{1}{2}$–2 ft. long, diffusely branched from the base, the branches angular, clothed throughout with short spreading grey silky hairs. Stipules linear-setaceous, $\frac{3}{4}$–$\frac{5}{8}$ in. long. Leaves nearly sessile, the rachis 1–$1\frac{1}{2}$ in. long; leaflets in 3–4 pairs, oblanceolate, 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad; apex rounded, mucronate, upper surface glabrous, lower finely silky. Flowers usually axillary, 1–3 together, casually in 4–6-flowered short racemes. Calyx silky, $\frac{1}{4}$–$\frac{3}{8}$ in. deep, the teeth linear-setaceous, as long as the tube. Corolla purplish, slightly exceeding the calyx. Pod 2–$2\frac{1}{2}$ in. long, 2 lines broad, distinctly recurved, finely grey-downy, 10–12-seeded.—*T. Apollinea*, Guill. et Perr. Fl. Seneg. 196; A. Rich., Fl. Abyss. i. 187, non DC. *T. Cordofana*, Hochst. in Kotsch. Hb. Nub. 181.

Upper Guinea. Senegambia, *Perrottet! Heudelot!* and others.

Nile Land. Nubia, *Kotschy! Schweinfurth! Binder.* Abyssinia, *Schimper! Petit.*

This is probably the plant intended by Persoon under the name of *T. uniflora* (Ench. ii. 329), but the flowers are described as solitary. *T. lathyroides*, Guill. and Perr. Fl. Seneg. 193, may be this. We have seen the original specimen, but it is too imperfect to form a decided opinion upon. Respecting *T. hirsuta*, Schum. and Thonn. Pl. Guin. 377, we cannot form any definite opinion from the description alone.

37. **T. elegans,** *Schum. et Thonn. Pl. Guin.* 376. Stems suffruticose, 3–4 ft. high, the branches firm, ascending, subterete, densely clothed with adpressed silvery hairs. Stipules linear-lanceolate, 2–3 lines. Leaves subsessile, the rachis 3–9 lines long, the leaflets in one or two pairs, narrowly oblanceolate, $1\frac{1}{2}$–2 in. long, $\frac{1}{4}$ in. broad, narrowed from a third of the way down to the base, the point rounded and mucronate, the upper surface glabrous, lower densely grey-silky, midrib subferruginous. Flowers 2–3 together from the axils of the upper leaves and a few close clusters towards the apex of the stem with their subtending leaves much reduced. Calyx subsessile, 3–4 lines deep, densely silvery and slightly tawny, the teeth lanceolate, exceeding the tube. Corolla yellowish, half as long again as the calyx, the standard 4 lines broad, very silky on the back. Pod linear-oblong, $1\frac{1}{2}$–2 in. long, $\frac{1}{4}$ in. broad, densely clothed with adpressed silvery hairs, 8–9-seeded, the sutures ferruginous.—Hook. f. Fl. Nigr. 299.

Upper Guinea. Guinea proper, *Thonning, Vogel! Barter!*

Lower Guinea. Pungo Andongo and Golungo Alto, Angola, *Dr. Welwitsch!*

38. **T. dasyphylla,** *Welw. mss.* An erect undershrub with cæspitose branched or simple stems densely clothed with spreading grey down. Stipules linear-subulate, $\frac{1}{4}$–$\frac{5}{8}$ in. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in., rigidly

erecto-patent. Leaves all digitately trifoliolate; leaflets oblanceolate, reaching 2–3 in. long, $\frac{1}{2}$–$\frac{7}{8}$ in. broad, blunt, rigidly coriaceous, very pale green, glabrous above, permanently clothed with thick adpressed grey velvety pubescence beneath, the veins immersed. Flowers 12–30 in dense terminal heads sometimes extending into the axils of the upper leaves. Bracts linear, silky, $\frac{1}{4}$–$\frac{3}{8}$ in. Pedicels 1–2 lines, stiff, ascending. Calyx $\frac{3}{8}$ in. long, densely silky, the upper teeth at least as long as the tube, the lower longer and reaching down deeper. Corolla violet-purple, $\frac{3}{4}$–$\frac{7}{8}$ in.; standard $\frac{3}{4}$ in. broad, densely silky on the back. Pod subligneous, 2 in. long, $\frac{3}{8}$ in. broad, 7–8-seeded, persistently grey-velvety, the sutures tawny. Style bearded throughout especially along the inner edge.

Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch!*

39. **T. cephalantha,** *Welw. mss.* An erect copiously branched undershrub 1–2 ft. high, the flexuose branches densely clothed with spreading greyish-brown pubescence. Stipules linear, membranous, $\frac{1}{4}$ in. long, purplish-black, falcate. Petioles 1–1$\frac{1}{2}$ lines. Leaflets 3, rarely 5, casually 1 at the base of the branches, oblanceolate, reaching 12–18 lines long, 3–4 lines broad, rigidly coriaceous, upper surface glabrous, lower persistently argenteo-canescent, side ones smaller, all truncate, distinctly mucronate. Flowers 3–12 in dense sessile heads. Pedicels very short. Calyx 3–3$\frac{1}{2}$ lines long, densely clothed with spreading silvery hairs; teeth linear, all much longer than the tube. Corolla $\frac{1}{2}$–$\frac{5}{8}$ in., pale violet, turning yellowish when dried. Standard under $\frac{1}{2}$ in. broad, densely silky on the back. Pod 12–18 lines long, 3–3$\frac{1}{2}$ lines broad, straight, persistently thinly silky, 8–12-seeded. Style flattened upwards, faintly bearded along the inner edge.

Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch!*

Var. *β. decumbens*, Welw. mss.

Diffuse, half a foot high; stipules narrower; leaflets 6–9 lines broad; heads 3–4-flowered; calyx $\frac{1}{2}$ in. long, teeth subulate.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

40. **T. gracilipes,** *Guill. et Perr. Fl. Seneg.* 194, t. 49. Stems erect, very diffuse, annual, about a foot high, the branches slender, ascending, angular, thinly adpressed grey-silky. Stipules $\frac{1}{8}$ in. long, setaceous from a dilated base. Leaves nearly sessile, the rachis 1–1$\frac{1}{4}$ in. long, the leaflets in 3–5 pairs, linear, an inch long by 2 lines broad, apex rounded mucronate, upper surface glabrous, lower thinly adpressed-silky. Flowers in very lax terminal or leaf-opposed racemes of 2–4 each on filiform peduncles $\frac{1}{2}$–1 in. long. Pedicel equalling the calyx, which is finely silky, a line deep, the teeth lanceolate acuminate, reaching more than halfway down. Corolla purplish, twice the calyx, the standard $\frac{1}{8}$ in. broad. Pod finely downy, $\frac{3}{4}$–1 in. long, $\frac{1}{8}$ in. broad, 6–8-seeded.—A. Rich. Fl. Abyss. i. 189.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*
Nile Land. Abyssinia, *Quartin-Dillon, Schweinfurth!*

41. **T. linearis,** *Pers.; DC. Prod.* ii. 254. An erect copiously branched perennial 1–3 ft. high with very slender virgate branches with a few inconspicuous adpressed grey hairs. Stipules linear, very minute. Petioles 1–2 lines; rachis 6–18 lines; leaflets 5–17, linear, 12–15 lines long, $\frac{3}{4}$–1 line broad, ascending, glabrous above, persistently thinly grey-canescent below. Flowers 4–8 in very lax racemes which are sometimes stalked, sometimes reach down into the axils of the leaves. Pedicels 1–$1\frac{1}{2}$ lines, erecto-patent. Calyx 1 line long, densely silky; teeth linear-subulate, exceeding the tube. Corolla reddish, $\frac{1}{4}$ in. long; standard $\frac{1}{8}$ in. broad. Pod linear, 15–24 lines long, $\frac{1}{8}$ in. broad, slightly recurved, finely downy, 12–18-seeded.

Upper Guinea. Senegal, *Perrottet! Heudelot!* Guinea proper, *Thonning, Vogel!*
Nile Land. Nubia, *Kotschy!* and others.
Lower Guinea. Ambriz, Congo, *Dr. Welwitsch!*

42. **T. pulchella,** *Hook. f. Fl. Nigr.* 299. Stems erect, suffruticose, 2–3 ft. high, copiously paniculately branched, the branches ascending, straight, slender, thinly silky. Stipules $\frac{1}{8}$ in. long, setaceous. Leaves nearly sessile, the rachis an inch or less long, the leaflets in 4–5 pairs, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 1 line broad, rigidly coriaceous, narrowed gradually from the apex to the base, truncate or emarginate with a mucro, upper surface glabrous, lower quite argenteous. Flowers in very lax terminal and lateral racemes of 3–6 each, sometimes but not always on long peduncles or casually solitary in the axils of the leaves. Bracts subulate, $\frac{1}{8}$ in. long. Pedicels equalling the calyx, which is thinly silky, $\frac{1}{3}$ in. deep, the teeth subulate, reaching halfway down. Corolla reddish, twice as long as the calyx, the standard $\frac{1}{8}$ in. broad, silky on the back. Pod linear, $1\frac{1}{2}$–2 in. long, $\frac{1}{8}$ in. broad, nearly straight, finely grey-silky, 10–12-seeded.

Upper Guinea. Banks of the Quorra, *Dr. Baikie! Vogel! Barter!*

43. **T. longipes,** *Meissn. in Hook. Lond. Journ. Bot.* ii. 87. Stem suffruticose, 1–2 ft. high, erect, sparingly branched, terete, the branches slender, angular, thinly adpressed-silky. Stipules setaceous, $\frac{1}{4}$ in. long. Leaves sessile; rachis 2 in. long; leaflets in 4–5 pairs, linear, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, 2 lines broad, rigidly coriaceous, often folded, the upper surface glabrous, the lower argenteous. Racemes terminal and lateral, laxly 6–10-flowered, usually on long rigid peduncles but sometimes sessile. Pedicels and linear bracts equalling the calyx, which is 2 lines deep, brown-silky, the teeth lanceolate acuminate, subequal, reaching more than halfway down. Corolla purplish, 4 lines long in our plant, the standard $\frac{1}{4}$ in. broad, very silky on the back. Pod linear, nearly straight, $1\frac{1}{2}$–2 in. long, 2 lines broad, densely but finely brown-silky, 10–12-seeded.—Harv. Fl. Cap. ii. 208.

Nile Land. Karague, *Speke and Grant*, 487! at 5000 ft.
Also a plant of Natal and the north-east of Cape Colony.

44. **T. radicans,** *Welw. mss.* A wide-trailing perennial herb with copiously branched slender flexuose prostrate stems 2–3 ft. long, densely clothed with fine spreading pubescence. Stipules ovate, 1–1½ lines. Petioles 2–3 lines; rachis 2–4 lines; leaflets 5–7, obovate-oblong, 6–9 lines long, 3–4 lines broad, truncate, mucronate, above grey-green glabrous, persistently grey-silky below, the midrib tawny. Racemes copious, usually terminal, stalked, 6–15-flowered, 1–2 in. long, rarely running down among the leaves. Bracts lanceolate, very minute. Pedicels densely downy, 1–3 lines, lower often patent. Calyx 2 lines, finely downy; teeth lanceolate cuspidate, longer than the tube. Corolla reddish-purple, ½ in. long; standard ⅜ in. broad, silky on the back. Pod oblong, 6–8 lines long, ¼ in. broad, thin, finely grey-downy, 2–3-seeded. Style pubescent throughout, especially along the inner edge.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

45. **T. huillensis,** *Welw. mss.* A diffuse moderately branched lax perennial, 1–2 ft. high, the stems densely clothed with fine spreading tawny hairs. Stipules lanceolate acuminate, 4–6 lines. Petioles 12–18 lines; rachis 2–3 inches; leaflets 7–11, oblanceolate, reaching 1½–2 in. long, ⅜–⅝ in. broad, blunt, distinctly mucronate, glabrous above, finely grey-canescent below. Flowers 1–2 from the axils of the upper leaves, and in stalked close 6–12-flowered racemes. Bracts linear, 3–4 lines. Pedicels 2–3 lines, ascending. Calyx ⅜ in. densely silky, teeth linear-setaceous, much exceeding the tube. Corolla ½–⅝ in., reddish-purple, keel pale, standard ⅜ in. broad. Pod linear, 2–2½ in. long, 3½–4 lines broad, glabrescent, 12–14-seeded. Style bearded along inner edge.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

Var. β. *grandiflora*, Baker.

Bracts lanceolate. Calyx ½ in. long. Corolla ¾–⅞ in. long; standard ¼ in. broad. Immature pod densely silky.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

46. **T. reptans,** *Baker.* Stems suffruticose, wide-trailing, the branches firm, angular, clothed with dense pale brown spreading silky pubescence. Stipules ½ in. long, linear-subulate. Leaves subsessile, the rachis 4–7 in. long; the leaflets in 7–10 pairs, oblanceolate, ½–2½ in. long, ⅜–½ in. broad, emarginate and mucronate, upper surface glabrous, lower clothed with thin loose grey pubescence, the midrib ferruginous. Racemes terminal and lateral, lax, 6–12 in. long, on peduncles as long, the flowers of the lower part generally in pairs about an inch apart. Bracts linear-subulate, ¼–⅜ in. long. Lower pedicels ¼ in. long, villose. Calyx ¼ in. deep, densely grey-silky, the teeth linear-subulate, the lower ones reaching more than halfway down, the upper rather shorter. Corolla purplish, ¾ in. deep, the standard ½ in. broad, very silky on the back. Pod 2–2½ in. long, 2 lines broad, glabrescent, straight, 16–18-seeded. Style pubescent throughout, especially along the inner edge.

Nile Land. Creeping along the ground in luxuriant vegetation near water, lat. 5° S., long. 33° E. Alt. 3800 ft., *Speke and Grant!*
Mozamb. Distr. Zambesi land, Shupanga, *Dr. Kirk!*

47. **T. paniculata,** *Welw. mss.* A much-branched undershrub, 2–3 ft. high, the ascending branches densely clothed with short spreading grey pubescence. Stipules 2–3 lines, setaceous. Petioles 4–9 lines, rachis 12–18 lines; leaflets 5–7 (rarely 3 in uppermost leaves), oblanceolate-oblong, the end one reaching 2–2½ in. long, 8–9 lines broad, side ones much smaller, truncate, distinctly mucronate, both sides dull grey-green, upper inconspicuously, lower persistently grey-downy, the veins brownish. Racemes copious, both terminal and from the axils of many of the upper leaves so as to form a thyrsoid panicle, usually stalked. Pedicels 1–2 lines, densely downy. Bracts setaceous, 3–4 lines. Calyx ⅜ in., brownish, densely pubescent, teeth linear-setaceous, much exceeding the tube. Corolla reddish-purple, ½–⅝ in., standard 5 lines broad, densely silky on the back. Ovary linear, densely grey-silky, multiovulate. Style glabrous, faintly bearded at the point. Pod not seen.

Lower Guinea. Highlands of Pungo Andongo, Angola, *Dr. Welwitsch!*

48. **T. brunnea,** *Baker.* Stem suffruticose, 2 ft. high, erect, copiously clothed upwards with ascending brown-silky hairs. Stipules linear, silky on the back, 3–4 lines long. Petiole 3–6 lines long; rachis 1½–2 in.; leaflets 9–11, oblanceolate, 12–18 lines long, 3–6 lines broad, mucronate, green above, thinly clothed with adpressed grey-silky hairs, especially beneath. Racemes 12–20-flowered, moderately dense, sessile or nearly so, the lower flowers 2–3 together. Pedicels 1–1½ lines long, densely silky. Calyx ¼ in. deep, densely brown-silky, the lower teeth linear, reaching three-quarters, the upper halfway down. Corolla reddish, 7–8 lines long, the standard densely brown-silky on the back. Ovary linear, densely pubescent, 6–8-ovulate. Pod not seen. Style glabrous, penicillate at the point.

Nile Land. Abyssinia, *Schimper!*

49. **T. villosa,** *Pers.; DC. Prod.* ii. 213. Stems suffruticose, 2–3 ft. high, diffusely branched, the branches firm, angular, finely adpressed white-silky. Stipules linear-subulate, ¼ in. long. Petiole ¼–½ in.; rachis 4–5 in. long; leaflets in 6–10 pairs, oblanceolate, 1–1½ in. long, ¼–⅜ in. broad, upper surface glabrous, lower finely adpressed grey-silky. Racemes lax, terminal or lateral, 6–12 in. long, on peduncles nearly as long. Bracts linear, ¼ in. long. Pedicels equalling the calyx, which is ¼ in. deep, densely silky, the lower teeth linear-subulate, reaching more than halfway down, the upper ones rather broader and shorter. Corolla twice as long as the calyx, reddish, the standard 4 lines broad, very silky on the back. Pods curved, about 2 in. long, 2 lines broad, densely silky, 6–8-seeded. Style glabrous.—Wight et Arn. Prod. 213. Klotzsch in Peters' Mossamb. Bot. 47.

Mozamb. Distr. Zambesi land, *Peters! Dr. Kirk!* Island of Zanzibar, *Dr. Kirk!*

A common East Indian species.

50. **T. incana,** *Graham in Wall. Cat.* 5644. Stems suffruticose, 1½–3 ft. high, but according to Dr. Welwitsch annual only, diffusely branched from the base, densely clothed with spreading woolly grey pubescence. Stipules linear, ¼ in. long, woolly on the back. Petioles ¼–½ in. long; rachis 2–3 in. long; leaflets in 5–6 pairs, oblanceolate, 1–1½ in. long, ¼–⅜ in. broad, apex rounded, mucronate, upper surface thinly, lower densely grey-silky. Racemes terminal and lateral, 6–12 in. long, the lower flowers in clusters of 3–4 together an inch apart. Pedicels very short, densely silky. Calyx ⅜ in. deep, densely white-silky, the teeth linear-subulate, reaching three-quarters of the way down, the lowest the longest. Corolla reddish, half as long again as the calyx, the standard ⅗ in. broad, silky on the back. Pods deflexed, and then slightly recurved, 2 in. long, ¼ in. broad, densely and permanently silky, 6–9-seeded. Style glabrous, densely penicillate at the apex.—Wight et Arn. Prod. i. 212. Wt. Ic. ii. 371. *T. Apollinea*, Klotzsch in Peters' Mossamb. Bot. 47, non DC. *T. Ehrenbergiana*, Schweinf. Fl. Æthiop. 18.

Nile Land. Abyssinia, *Ehrenberg.*
Lower Guinea. Loanda, *Dr. Welwitsch!*
Mozamb. Distr. Isle of Mombas, *Bojer.* Zambesi land, *Peters! Dr. Kirk! Dr. Meller!*

A common East Indian species.

51. **T. coronilloides,** *Welw. mss.* A diffuse copiously branched undershrub, 2–2½ ft. high, the stems densely clothed with short ascending grey pubescence. Stipules linear, 1½–2 lines. Petioles 0 or very short; rachis 9–18 lines; leaflets 7–13, oblanceolate, ½–⅝ in. long, 3–4 lines broad, truncate or slightly emarginate, mucronate, both sides dull grey-green, upper glabrescent, lower finely canescent. Racemes copious, all lateral, 6–9-flowered, 1–1½ in. long. Bracts linear, 1½–2 lines. Pedicels 1–2 lines. Calyx 2 lines, densely silky, teeth linear-setaceous, exceeding the tube. Corolla reddish-purple, 4–4½ lines long, standard ¼ in. broad, densely silky on the back. Pod linear, persistently brown-velvety, 18–21 lines long, 2½ lines broad, slightly recurved, 10–12-seeded. Style glabrous, penicillate at the point.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

52. **T. decora,** *Welw. mss.* An erect undershrub, 2–3 ft. high, the slender flexuose ascending branches densely clothed with short spreading brownish pubescence. Stipules setaceous, 1½–2 lines. Petioles 3–6 lines. Leaflets 5–13, oblanceolate, reaching 18–21 lines long, 3–4 lines broad, blunt, mucronate, grey and glabrous above, rather densely argenteo-canescent beneath. Racemes copious, terminal and lateral, moderately dense, 2–2½ in. long, usually stalked, rarely sessile. Bracts linear-setaceous, very minute. Pedicels 1–1½ lines, densely grey-downy. Calyx 2–2½ lines, densely silky, teeth linear-setaceous, exceeding the tube. Corolla 4½–5 lines long, pale violet-purple, stan-

dard 4 lines broad, densely silky. Pod linear, $1\frac{3}{4}$–2 in. long, 2 lines broad, slightly recurved, persistently clothed with short spreading silky pubescence, 10–12-seeded. Style glabrous.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

53. **T. drepanocarpa,** *Welw. mss.* A decumbent perennial herb, with trailing stems more than a foot long, branched and ascending towards the end, clothed with short spreading grey pubescence. Stipules lanceolate, patent, $1\frac{1}{2}$–2 lines. Petioles 1–3 lines; rachis 9–18 lines; leaflets 7–13, oblanceolate, 6–9 lines long, 2–3 lines broad, blunt, mucronate, glabrous above, thinly grey-downy below. Racemes copious, terminal and lateral, reaching 3–4 in. long, moderately dense, the axis densely pubescent. Pedicels 1–$1\frac{1}{2}$ lines. Bracts linear as long as the pedicels. Calyx $\frac{1}{8}$ in. long, finely grey-downy, teeth linear, as long as the tube. Corolla bright rose-purple, twice the calyx. Pod 9–12 lines long, $2\frac{1}{2}$ lines broad, much recurved, 4–6-seeded, glabrescent, slightly torulose when mature. Style glabrous, penicillate at the point.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

54. **T. Apollinea,** *DC. Prod.* ii. 254, *non aliorum.* Stems suffruticose, 12–18 in. high, diffusely branched from the base, the branches firm, subglabrous. Stipules linear, firm, 2 lines long. Petioles $\frac{1}{2}$–1 in. long. Rachis an inch or less long; leaflets in 2–4 pairs, oblong or oblanceolate, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, apex emarginate and mucronate, the upper surface quite and the lower nearly glabrous. Racemes terminal or lateral, laxly 6–12-flowered, stalked or sessile. Bracts linear, rigid like the pedicel equalling the calyx, which is subglabrous, 2 lines deep, the teeth linear-subulate, reaching halfway down. Corolla red, twice as long as the calyx, the standard 4 lines broad. Pods linear, slightly upcurved, 18–21 lines long, 2 lines broad, glabrous, 6–9-seeded. Style glabrous, pencillate at the point.—*Galega Apollinea,* Delile Fl. Ægypt. 144, t. 33.

Nile Land. Nubia, *Kotschy! Schweinfurth! Binder! Petherick! Bromfield!* Sometimes cultivated.

Extends northward into Egypt, and through Arabia into Scinde. The *T. Apollinea,* Guill. and Perr. Fl. Seneg. 196; A. Rich. Fl. Abyss. i. 187, is *T. anthylloides,* and of Klotzsch in Peters' Mossamb. Bot. 47, is *T. incana.*

55. **T. purpurea,** *Pers.; DC. Prod.* ii. 251. A copiously branched herbaceous perennial, 1–2 ft. high, with firm, slender, subglabrous stems. Stipules linear, 2–4 lines. Petioles 1–3 lines; rachis 2–3 in.; leaflets 13–17, oblanceolate, 9–12 lines long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, blunt, mucronate, subcoriaceous, both sides grey-green, upper glabrous, lower nearly so. Racemes terminal and lateral, 3–6 in. long, laxly 6–20-flowered, sessile or shortly stalked. Bracts linear, 1–2 lines. Pedicels 1–2 lines, subglabrous, erecto-patent. Calyx 2 lines, slightly silky, teeth lanceolate acuminate, exceeding the tube. Corolla $\frac{1}{4}$–$\frac{3}{8}$ in., red-purple, standard $\frac{1}{4}$ in. broad. Pod linear, slightly recurved, glabrous, $1\frac{1}{2}$–2 in. long, 2 lines broad, 6–10-seeded. Style glabrous, penicillate at the point.—*T. leptostachya,* DC. loc. cit. *T. indigofera,* Bert. Misc. xix. 9, t. 5.

Upper Guinea. Senegal, *Perrottet!* and others.
North Central. Kouka, *E. Vogel!*
Nile Land. Nubia, *Kotschy! Petherick!* Abyssinia, *Schimper! Quartin-Dillon!*
Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Sofala, *Dr. Peters!* Zambesi land, *Dr. Kirk! Dr. Stewart!*

Var. β. *pubescens*, Baker.
Leaves, stem, and young pod slightly downy.

Upper Guinea. Gold Coast, *Thonning! Capt. Burton!* Sierra Leone, *Afzelius!*
Lower Guinea. Ambaca and Loanda, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Meller!*
A cosmopolitan species in the Tropics.

56. **T. nubica,** *Baker.* Stems woody, 12–18 in. long, diffusely branched, the branches terete, densely coated with short white silky pubescence. Stipules lanceolate, $\frac{1}{8}$ in. long. Leaves nearly sessile, the rachis woolly like the branches, the leaflets in 3–4 pairs, oblanceolate, 1–$1\frac{1}{2}$ in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, apex rounded, mucronate, both sides very pale, and especially the lower one densely white-silky. Racemes terminal or leaf-opposed, 6–12-flowered, 3–4 in. long, on long or short rigid peduncles. Pedicels and bracts shorter than the calyx, which is $\frac{1}{4}$–$\frac{3}{8}$ in. deep, densely white-silky, the teeth linear, reaching more than halfway down. Corolla pinkish, slightly exceeding the calyx, the standard $\frac{1}{4}$ in. broad, very silky on the back. Pod twice as long as the calyx, densely clothed with long half-spreading white silky hairs, 1-seeded.—*Pogonostigma nubicum*, Boiss. Diagn. ii. 40. *P. abyssinicum*, Jaub. et Spach. Illust. Pl. Or. t. 477-8.

Nile Land. Kordofan, *Kotschy! Cienkowsky.* Abyssinia, *Schimper.*

57. **T. sphærosperma,** *Baker.* A copiously branched diffuse undershrub, about a foot high, the branches woody, clothed with fine grey pubescence when young. Stipules $\frac{1}{8}$ in. long, rigid, linear, falcate, persistent. Petioles a line long, downy. Leaves simple, obovate, half an inch long, more than half as broad, firm, grey, generally folded, apex mucronate, recurved, veins prominent, both surfaces, especially the under one, finely downy. Flowers axillary, 1–3 together, nearly sessile. Calyx tubular, $\frac{1}{8}$ in. deep, the teeth lanceolate, not reaching halfway down. Corolla pale yellow, not twice as long as the calyx. Pod spathulate mucronate, $\frac{1}{4}$–$\frac{3}{8}$ in. long, finely downy, 1-seeded.—*Requienia sphærosperma*, DC. Prod. ii. 168. Harv. Fl. Cap. ii. 230.

South Central. The interior just north of the Tropic of Capricorn, *Chapman and Baines!*
A Cape species.

58. **T. obcordata,** *Baker.* A woody undershrub, 2–3 ft. high, the branches firm, straight, ascending, terete, clothed with fine grey tomentum. Stipules subulate, a line long, rigid, persistent. Leaves subsessile, simple, obcordate, $\frac{1}{2}$–$\frac{3}{4}$ in. long, three-quarters as broad, apex truncate or retuse with a mucro, texture coriaceous, both sides grey-green, and the veins very prominent, the upper one subglabrous when mature, the lower densely coated with fine short whitish silky

tomentum. Calyx subsessile, $\frac{1}{8}$ in. long, densely tomentose, the teeth lanceolate, reaching down to the middle. Pod ovoid, $\frac{1}{4}$ in. long, more than half as broad, densely and persistently grey-villous, 1-seeded.—*Requienia obcordata*, DC. Mem. Leg. 226 t. 37. Prod. ii. 168.

Upper Guinea. Senegambia, *Leprieur and Perrottet, Heudelot! Bidjem!*
Nile Land. Kordofan, *Kotschy! Cienkowsky.*

21. **MUNDULEA,** DC.; Benth. et Hook. f. Gen. Plant. i. 497.

Calyx-teeth short, the two upper ones subconnate. Standard large, spreading, obovate, transversely callose at the base of the blade; wings falcate-oblong, slightly adhering to the keel; keel obtuse, the point incurved. Upper stamen free and geniculate at the base, united upwards with the rest in a closed tube, alternate filaments slightly dilated, anthers uniform. Ovary multiovulate; style incurved, indurated, subterete, glabrous, the apex inflexed, the stigma capitate. Pod linear, flat, the sutures very thick, ultimately dehiscing.—Subarborescent shrubs.

Three species, the two others Mascarene. A connecting link between *Tephrosia* and *Millettia*.

1. **M. suberosa,** *Benth.; Walp. Ann.* iv. 491. A shrub, 4–6 ft. high, with corky bark, the branches ascending, sulcate, finely grey-downy upwards. Rachis of leaves 4–6 in. long, leaflets in 6–10 pairs, oblong or oblong-lanceolate, 1–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, pale green, glabrous above, clothed with fine yellowish-grey silky pubescence beneath. Racemes terminal and leaf-opposed, 4–6 in. long. Pedicels $\frac{1}{2}$ in. long, slender, silky. Calyx campanulate, $1\frac{1}{2}$–2 lines deep, finely silky, the teeth very short. Corolla reddish, an inch deep. Pod 3–5 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, finely silky, torulose, 6–8-seeded.—*Tephrosia suberosa*, DC. Prod. ii. 249. Harv. Fl. Cap. ii. 204. Wight Illust. t. 79. Hook. Ic. t. 120. *T. Petersiana*, Klotzsch in Peters' Mossamb. Bot. t. 9. *Dalbergia striata*, Bojer, Hort. Maur. 111 (name only). *Tephrosia icthynica*, Bert. Misc. xviii. 18, t. 3.

Upper Guinea. Niger country, Abbeokuta, *Irving!*
Lower Guinea. Angola, *Dr. Welwitsch!*
South Central. In the interior near the Tropic of Capricorn, *Chapman and Baines!*
Mozamb. Distr. Banks of Lake Ngami, *McCabe!* Mozambique, *Peters! Kirk!* Sofala, Inhambane, *Fornasini.*

A well-known East Indian species, and extending southward to Natal and Macalisberg.

22. **MILLETTIA,** Wight et Arn.; Benth. et Hook. f. Gen. Plant. i. 498.

Calyx-tube campanulate, the teeth short. Standard large, spreading or reflexed, naked or callose above a short claw or rarely furnished with inflexed auricles; wings falcate-oblong, free from the keel, coherent or free at the point; keel incurved, obtuse. Upper stamen free

at the base, more or less connate with the others about the middle or quite free; filaments not dilated; anthers uniform. Ovary sessile or rarely stalked, often surrounded by an annular disk or short sheath, multi-ovulate; style inflexed, terete, glabrous, with a small terminal stigma. Pod linear-lanceolate or oblong, compressed, coriaceous or woody, two-valved, ultimately dehiscing.—Shrubs or trees, distinguished from *Lonchocarpus* only by the pod ultimately dehiscing, so that for want of fully ripe fruit the place of several of the species is uncertain.

A moderate-sized genus, with one Australian and two Cape species; the others which are not African plants of Tropical Asia.

Leaves and branches glabrous or subglabrous.
  Exstipellate.
    Standard 1 in. broad . . . . . 1. *M. macrophylla.*
    Standard ½ in. broad . . . . . 2. *M. Mannii.*
  Stipellate.
    Standard naked on the back; leaflets 7–9 . . . . . 3. *M. Thonningii.*
    Standard silky on the back; leaflets 11–21.
      Stamens monadelphous . . . . . 4. *M. drastica.*
      Stamens diadelphous.
        Corolla ⅜ in. deep; leaflets 1½–2 in. long . . . . . 5. *M. gracilis.*
        Corolla 9–12 lines deep; leaflets 4–5 in. long . . . . 6. *M. versicolor.*
Leaves beneath and branches pubescent.
  Exstipellate.
    A climber; corolla ½ in. deep . . . . . 7. *M. urophylla.*
    Erect trees; corolla 9–12 lines deep.
      Standard naked on the back . . . . . 8. *M. aboensis.*
      Standard silky on the back.
        Leaflets 7–9, 3–4 in. long . . . . . 9. *M. nudiflora.*
        Leaflets 17–21, 1–2 in. long. . . . . 10. *M. ferruginea.*
  Stipellate . . . . . 11. *M. rhodantha.*

1. **M. macrophylla,** *Hook. f. Fl. Nigr.* 318, t. 32-3. A small tree with terete branches. Leaves glabrous, long-stalked, the rachis often a foot long, firm, and glabrous like the twigs. Leaflets in 5–7 pairs and a terminal one, the upper ones obovate-oblong, 4–6 in. long, 2½–3 in. broad, the apex not narrowed, upper surface deep green, glabrous, lower pale-green, very finely silky, the veins raised and ferruginous. Petiolules 2–3 lines long, without stipellæ. Flowers in lax long-stalked erect racemes a foot long, the lower ones 5–6 in a cluster on short branches. Bracts lanceolate, deciduous, equalling the silky pedicels, ¼ in. long. Calyx deeply campanulate, 3–4 lines deep, densely brown-silky, the teeth very nearly obsolete. Corolla an inch long, purplish, the standard an inch broad, not silky on the back, the upper filament free to the middle. Pod oblong-lanceolate, 4–5 in. long, 1¼ in. broad, glabrous when mature, very coriaceous, 4–6-seeded, not at all torulose.

Upper Guinea. Fernando Po, *Vogel!*

2. **M.? Mannii,** *Baker*. A tree or shrub with glabrous branches. Petioles 2–3 in. long. Leaves 8–9 in. long, with 15–17 obovate-oblong pointed subcoriaceous opaque pale-green glabrous leaflets, the upper ones 3–3½ in. long, 12–15 lines broad, the main veins beneath

raised. Petiolules 2 lines long, not stipellate. Flowers in a long-stalked slightly compound panicle about as long as the leaf with racemose branches. Pedicels very short. Calyx campanulate, 2–2½ lines deep, slightly brown-silky, the teeth obsolete. Corolla reddish. ¾ in. deep, the orbicular standard ½ in. broad, quite glabrous on the back, the wings and much incurved keel nearly as long. Stamens monadelphous. Ovary linear, sessile, very silky, pluriovulate. Pod unknown.

Upper Guinea. Gaboon river, *Mann!*

3. **M. Thonningii,** *Baker.* A tree 30–40 ft. high, with glabrous branches. Stipules none or deciduous. Petiole about an inch long, the rachis of the leaf 3–6 in. long, both glabrous; leaflets 7–9, the upper oblong acuminate, 3–5 in. long, 2–2½ in. broad, the lowest pair considerably shorter, the petiolules about 2 lines long, with small spreading setaceous deciduous stipellæ, subcoriaceous, both sides glabrous, the veins beneath not prominent. Flowers in sessile drooping axillary racemes 4–8 in. long. Bracts linear or lanceolate, shorter than the slender pedicels, which are 2 lines long, and about equal the glabrous or slightly pubescent broadly campanulate calyx. Calyx-teeth deltoid, reaching about a quarter down, the lowest the narrowest, the two uppermost connate. Corolla ½–⅝ in. deep, lilac or violet, standard orbicular, ⅝ in. broad, glabrous. Upper stamen free above the middle. Pod linear-oblong, 6–8 in. long, ¾ in. broad, glabrous, firm, subligneous, slightly curved, 5–6-seeded.—*Robinia Thonningii*, Schum. et Thonn. Pl. Guin. 349. *M. Griffoniana*, Baillon, Adans. vi. 222.

Upper Guinea. Guinea proper, Sierra Leone, *Afzelius! Thonning, Vogel! Barter! Irving! Mann! Griffon du Bellay.* Fernando Po, *Mann!* Senegambia, *Heudelot!*

Lower Guinea. Angola, *Dr. Welwitsch!*

A very handsome tree, with copious drooping racemes of pale lilac flowers. Dr Welwitsch has gathered in Congo a plant which differs by having the leaflets alternate instead of opposite, and the pods shorter and broader, 2½–3 in. long, 10–12 lines broad, –3-seeded.

4. **M. drastica,** *Welw. mss.* A shrub or small tree 10–15 ft. high, with the habit of *Fraxinus*, with glabrous branches. Petioles 1–2 in. long. Leaves 6–12 in. long, with 15–19 obovate or oblong subcoriaceous pointed glabrous leaflets, the terminal one 2–3½ in. long, 12–20 lines broad, on petiolules 2 lines long, with deciduous setaceous stipellæ. Flowers in stiff short ascending axillary and terminal racemes about as long as the leaves, the lower ones 2–3 together. Pedicels 1½–2 lines long. Calyx campanulate. 2–2½ lines deep, finely brown- or grey-velvety, with deltoid teeth not reaching more than a quarter down. Corolla deep purplish lilac, 8–9 lines deep. Standard orbicular, 7–8 lines broad, finely silky on the back. Stamens monadelphous. Pod sessile, subligneous, glabrous, linear-oblong, compressed, 5–7 in. long, 9–10 lines broad, many-seeded.

Lower Guinea. Angola, Cazengo, Golungo Alto, &c., *Dr. Welwitsch!*

5. **M. gracilis,** *Welw. mss.* A slender shrub 3–5 or rarely 8–10 ft. high, with glabrous branches. Petioles slender, an inch long. Leaves 6–8 in. long, with 15–21 obovate-oblong blunt deflexed glabrous leaflets, the terminal one 1½–2 in. long by half as broad, opaque above, glaucescent below. Petiolules a line long with minute deciduous stipellæ. Flowers in lax or moderately dense short-stalked racemes about as long as the leaves, the lower ones in pairs or fascicles. Pedicels 1½–2 lines long, finely silky. Calyx 1½–2 lines deep, nearly glabrous, obliquely campanulate, the teeth almost obsolete. Corolla deep rose-violet, ⅜ in. deep, the standard orbicular, ⅜ in. broad, finely argenteous on the back, the wings and much incurved keel nearly as long. Upper stamen free to the base. Pod linear-oblong, sessile, ligneous, flat, quite glabrous, 3–4 in. long, ½ in. broad, 3–5-seeded.

Lower Guinea. Angola; Ambaca, and Golungo Alto, *Dr. Welwitsch!*

6. **M. versicolor,** *Welw. mss.* An erect shrub, 5–10 ft. high, with glabrous branches. Petioles 1½–2 in. long. Leaves 8–12 in. long, with 11–13 glabrous subcoriaceous obovate or oblong acuminate or cuspidate leaflets like the leaves of *Fagus sylvatica* in texture, upper ones 4–5 in. long, 1½–2 in. broad, the main veins beneath prominent. Petiolules 2½–3 lines long, stipellate. Flowers in ample stalked terminal panicles sometimes a foot long with racemose or subcapitate branches glabrous downwards. Pedicels 2–3 lines long. Calyx broadly campanulate, 2½–3 lines deep, densely brown-silky, the deltoid teeth reaching a quarter down. Corolla 9–12 lines long, the orbicular emarginate reflexed standard ½–⅝ in. broad, bright yellow within, densely brown-silky on the back; the violet-purple wings and keel nearly as long. Upper stamen free. Pod ligneous, permanently brown-silky, linear-oblong, sessile, 4 in. long, 16–18 lines broad, decurved, 2–3-seeded.

Lower Guinea. Angola, *Dr. Welwitsch!*

7. **M. urophylla,** *Welw. mss.* A wide-climbing shrub with a trunk 3–4 in. thick, the young branches densely clothed with fine ferruginous pubescence. Petioles 3–6 in. long. Leaves 4–12 in. long, with 3–9 obovate-oblong cuspidate opaque subcoriaceous leaflets, glabrous above, at first finely brown-downy on the veins below, the terminal one 2–8 in. long, 1–5 in. broad; petiolules 2–4 lines long, without stipellæ. Flowers in rigid subdense axillary stalked racemes or panicles 1–2 times as long as the leaves, usually fascicled. Pedicels 1½–2 lines long, finely downy. Calyx campanulate, 1½–2 lines deep, finely brown-silky, the teeth very short, deltoid. Corolla rose-violet, ½ in. deep; standard oblong, 4 lines broad, at first thinly argenteous on the back; wings and keel scarcely shorter. Upper stamen free from the base. Ovary linear, sessile, silky, multiovulate. Pod (only seen immature) linear-oblong, deflexed, ¾ in. broad, subligneous, densely brown-velvety.

Lower Guinea. Angola, *Dr. Welwitsch!*

8. **M. ? aboensis,** *Hook. f. Fl. Nigr.* 320 (as a var. of *M. macrophylla*). A tree 30–40 ft. high, the ultimate branches densely clothed with fine dark-brown spreading pubescence. Petioles 3–4 in. long; rachis 6–8 in. long, both pubescent; leaflets in 5–6 pairs, the upper ones obovate-oblong, 4–5 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad, the lower ones shorter and broader, petiolules 2 lines long without stipellæ, texture subcoriaceous, upper surface dark green, glabrous, lower more or less ferruginous-pubescent, especially on the prominent veins. Racemes 6–12 in. long, on firm woody erect peduncles, the lower part with a few short branches. Pedicels 2 lines long. Bracts lanceolate or oblong-lanceolate, soon falling. Calyx $\frac{3}{8}$ in. deep, densely ferruginous-silky, the teeth nearly obsolete. Corolla an inch deep, reddish, the standard $\frac{3}{4}$–$\frac{7}{8}$ in. broad, glabrous on the back, the upper stamen free above the middle. Pod linear-oblong acuminate 6 in. long, 1 in. broad, very coriaceous, densely bright ferruginous-silky.

Upper Guinea. Guinea proper, *Vogel! Ansell!* and others.

Our specimens received since the Niger Flora was written, show clearly that this is distinct as a species from *M. macrophylla;* but we have no pods in a mature state.

9. **M. nudiflora,** *Welw. mss.* A tree 30–40 ft. high with finely brown-velvety branchlets, no leaves at the flowering time. Petioles 1–2 in. long. Leaves 6–7 in. long, with 7–9 obovate-oblong pointed subcoriaceous leaflets, the terminal one 3–4 in. long, 15–18 lines broad, cuneate at the base, green and glabrous above, thinly grey-silky over the surface, brown-silky on the veins beneath, on downy exstipellate petiolules 2 lines long. Flowers in very copious short-stalked moderately dense nutant racemes 4–5 in. long. Pedicels 2–3 lines long, downy. Calyx narrowly campanulate, 4 lines deep, finely brown-silky, the lanceolate-deltoid teeth reaching about a quarter down. Corolla bright violet, 9–10 lines long; standard obovate, $\frac{1}{2}$ in. broad, recurved, finely argenteous on the back; wings and keel rather shorter. Stamens all connate. Pod (rather immature) linear-oblong, subligneous, sessile, glabrous, 4–5 in. long, an inch broad, straight, 7–10-seeded.

Lower Guinea. Angola, *Dr. Welwitsch!*

10. **M. ferruginea,** *Baker.* A large tree with firm terete ultimate branches clothed with fine short ferruginous silky tomentum. Stipules lanceolate, $\frac{1}{4}$ in. long. Petioles 1–$1\frac{1}{2}$ in. long, the rachis 8–12 in. long, ferruginous silky like the twigs; leaflets in 8–10 pairs and a terminal one, oblong or oblong-lanceolate, 1–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, apex narrowed, base rounded, texture coriaceous, under surface finely silky, the veins ferruginous, not prominent, the petiolules a line long, ferruginous, without stipellæ. Flowers in long-stalked lax erect racemes 6–9 in. long, the lower ones distant, 3–4 in a cluster. Pedicels silky, about equalling the calyx, which is between campanulate and tubular, 3–4 lines deep, densely coated with fine brown silky pubescence, the teeth very short, subdeltoid. Corolla three times as long as the calyx, cream-coloured, the standard very silky on the back

Pod linear-oblong, 6–7 in. long, $\frac{3}{4}$ in. broad, coriaceous or almost woody, glabrous.—*Sesbania ferruginea*, Hochst. in Schimp. Hb. Abyss. 279. *Berebera ferruginea*, Hochst. in Flora, 1846, 597. A. Rich. Fl. Abyss. i. 190, t. 35. *Inga byrsinocarpa*, Hochst. in Schimp. Hb. Abyss. No. 536.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon, Petit.*

Berebera is the Abyssinian name of this handsome tree; the powdered seeds are thrown into the water to stupify fish.

11. **M. rhodantha,** *Baill. Adans.* vi. 223. An erect tree 30–40 ft. high, with yellow aromatic wood, the branches densely brown-velvety. Petioles 1 in. long. Leaves 6–8 in. long, with 13–21 slightly oblique oblong pointed subcoriaceous leaflets, $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, 8–9 lines broad, glabrous above, brown-velvety on the midrib and glaucescent beneath, on petiolules 1 line long with persistent setaceous stipellæ. Flowers in moderately dense axillary racemes about as long as the leaves, the lower flowers fascicled, the clusters casually stalked. Pedicels 2–3 lines long, brown-velvety. Calyx $\frac{1}{8}$ in. deep, the teeth very short. Corolla violet, $\frac{1}{2}$ in. deep, the orbicular standard 4 lines broad, at first thinly silky on the back. Stamens all connate. Pod (only seen immature) linear-oblong, sessile, many-seeded.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Morson!*
Lower Guinea. Angola, *Dr. Welwitsch!*

23. **PLATYSEPALUM,** Welw. mss.

Calyx with a short campanulate tube clasped by two large persistent oblong bracteoles; two upper teeth connate into a broad emarginate cucullate lip as long as the corolla, three lower linear-lanceolate. Standard obcordate, shortly unguiculate, wings and keel nearly equalling it, the former blunt, the latter slightly incurved, obtuse, shortly auriculate and unguiculate. Upper stamen free from the base; anthers uniform, oblong, versatile. Ovary linear, sessile, 5–7-ovulate; style filiform, glabrous, incurved; stigma minute, terminal. Pod linear-lanceolate, compressed, woody, 2-valved, ultimately dehiscing, 3–5-seeded.

An erect small tree, with imparipinnate leaves, and the general habit of *Millettia*, from which it principally differs by the extraordinary calyx.

1. **P. violaceum,** *Welw. mss.* A tree 10–20 ft. high, branches clothed with fine grey-brown pubescence. Petioles 12–15 lines long. Leaves 4–10 in. long with 7–9 oblong or obovate-oblong acuminate or cuspidate coriaceous leaflets, pale green and rather shining above, opaque and finely silky on the ribs beneath, terminal one 3–6 in. long, $1\frac{1}{4}$–$2\frac{1}{2}$ in. broad; petiolules 2 lines long with persistent setaceous stipellæ. Flowers in copious rigid ascending axillary panicles with short arcuate ascending racemose branches naked downwards. Pedicels 1–2 lines long, densely silky. Calyx 7–8 lines long, bracteoles half as long, both densely grey-silky, the hooded violet upper lip $\frac{1}{2}$ in. broad.

Corolla just as long as the calyx, yellowish. Pod 3–3½ in. long, ¾ in. broad, permanently pale brown velvety.

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

24. **MICROCHARIS**, Benth. in Benth. et Hook. f. Gen. Plant. i. 501.

Calyx minute, with a campanulate tube and five subequal teeth. Standard orbicular; keel and wings with a long claw, the latter shortest. Upper stamen free above the middle, the others all connate; anthers uniform, not distinctly apiculate. Ovary sessile, linear, multi-ovulate, narrowed gradually into a short ascending glabrous style; stigma capitate. Pod sessile, linear, compressed, two-valved, thinly septate between the seeds.—Diffuse annuals with simple leaves and racemose flowers.

Restricted to Tropical Africa, the three species very near to one another, perhaps all varieties of one.

Stipules setaceous.
- Corolla 1½ lines . . . . . 1. *M. tenella.*
- Corolla 2–2½ lines . . . . . 2. *M. angolensis.*

Stipules foliaceous . . . . . 3. *M. latifolia.*

1. **M. tenella,** *Benth. in Linn. Trans.* XXV. 297, t. 33 A. Stems diffuse, very slender, finely grey-hispid. Stipules setaceous, 1–1½ lines, spreading, persistent. Petioles 1–1½ lines. Leaves lanceolate, reaching 1–2 in. long, 3–6 lines broad, narrowed to both ends, mucronate, subcoriaceous, pale green, glabrescent above, obscurely grey-hispid below. Flowers up to a dozen in copious, distinctly peduncled, axillary racemes which equal or exceed the leaves. Bracts setaceous, ½ line, rarely foliaceous. Pedicels patent, ½–1 line. Calyx ½ line, densely grey-hispid, the lanceolate teeth exceeding the tube. Corolla bright scarlet, membranous, fugacious, ⅛ in. long. Pod linear, slightly recurved, 8–9 lines long, ¾ line broad, 8–10-seeded.

Upper Guinea. Nupe and banks of the Quorra at Jeba, in crevices of rocks after the rains, *Dr. Vogel! Barter!*

2. **M. angolensis,** *Baker.* General habit of the preceding, but more hispid, with less numerous and more distant leaves. Stipules setaceous, 2 lines. Leaves narrow-lanceolate, subsessile, reaching 2–2½ in. long, 3–4 lines broad, dull green, both sides persistently grey-hispid. Lower racemes reaching 3–4 in. long, including the short peduncles, the flowers more numerous than in the last, the bracteoles similar but all the lower ones barren. Calyx ¾ line deep, the lanceolate-setaceous teeth exceeding the tube. Corolla 2–2½ lines. Ovary linear, hispid. Pod unknown.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

3. **M. latifolia,** *Benth. loc. cit.* General habit just as in the two others. Stipules 3–4 lines, foliaceous, ovate acuminate, deeply cordate on

the outer side. Leaves subsessile, subcoriaceous, the lower ones obovate-oblong, 2 in. long, 1 in. broad. Racemes about 6-flowered, either truly axillary on short peduncles or terminal on short branches from the axils of the leaves. Calyx under $\frac{1}{2}$ line, copiously hispid. Corolla $\frac{1}{8}$ inch. Pod not seen.

Mozamb. Distr. Zambesi-land, on the riverbank near Luabo, *Dr. Kirk!*

25. **SESBANIA,** Pers.; Benth. et Hook. f. Gen. Plant. i. 502.

Calyx broadly campanulate, with short subequal teeth. Petals all distinctly unguiculate; standard large, emarginate orbicular; wings oblong; keel incurved, obtuse. Stamens diadelphous; anthers uniform or nearly so. Ovary sessile or short-stalked, multiovulate, style glabrous, incurved; stigma capitate. Pod linear, compressed, or terete or tetragonous or 4-winged, usually dehiscing.—Herbs or soft-wood shrubs of brief duration with very numerous leaflets and flowers in axillary racemes.

A small genus dispersed through the Tropics of both hemispheres, many of the species very closely allied and difficult to define.

SUBGENUS 1. **Eusesbania.**—Pod not winged.
- Valves of the pod rounded on the back.
  - Corolla 8–9 lines long.
    - Shrubby, with peduncled lax racemes . . . . . 1. *S. punctata.*
    - Annual, with subsessile abbreviated racemes . . . . . 2. *S. pachycarpa.*
  - Corolla 6–7 lines long.
    - Branches finely downy; lower pedicels 6–9 lines long . . 3. *S. cinerascens.*
    - Branches glabrous; lower pedicels 2–4 lines long.
      - Shrubby, unarmed . . . . . 4. *S. ægyptiaca.*
      - Annual, with prickly branches and leaf-rachis . . . 5. *S. aculeata.*
  - Corolla 4–5 lines long.
    - Branches and young leaves densely grey-silky . . . . 6. *S. pubescens.*
    - Branches and young leaves glabrous . . . . . 7. *S. leptocarpa.*
- Valves of the pod acutely keeled on the back . . . . . 8. *S. sphærosperma.*

SUBGENUS 2. **Daubentonia.**—Pod with 4 broad wings . . . 9. *S. tetraptera.*

1. **S. punctata,** *DC. Prod.* ii. 265. An erect, copiously branched glabrous glaucous shrub 5–10 ft. high. Petioles 6–9 lines, sometimes slightly prickly, upper leaves 3–8 in. long; leaflets 20–50-jugate, just like those of *S. ægyptiaca.* Peduncles 12–18 lines. Racemes lax, 6–12-flowered, casually compound. Lower pedicels 6–9 lines. Calyx 2 lines, broadly campanulate, glabrous, the deltoid cuspidate teeth a quarter the length of the tube. Corolla 8–9 lines long, the standard 8–9 lines broad, bright yellow, much spotted with purple. Pod 8–12 in. long, 2–$2\frac{1}{2}$ lines thick, 30–40-seeded, not torulose when mature, the valves rounded on the back.—*S. filiformis,* Hochst. in Schimp. Hb. Abyss. No. 775. *S. multijuga,* Schweinf. Hb. Callab. Exsicc. No. 1869.

Upper Guinea. Senegambia, *Leprieur! Heudelot!* Guinea proper, *Barter!*
North Central. Bornu and Soudan, *E. Vogel!*
Nile Land. Nubia, Kordofan, and Sennaar, *Knoblecher,* &c. Abyssinia, *Schimper!* &c.

Lower Guinea. Pungo Andongo and Golungo Alto, Angola, and a variety in Huilla with a muricated stem, *Dr. Welwitsch!*

2. **S. pachycarpa,** *DC. Prod.* ii. 265. A glabrous erect glaucous annual 1–3 ft. high, usually unarmed. Upper leaves 3–4 in. long; leaflets 15–20-jugate, reaching 8–9 lines, glabrous, very glaucous. Flowers 1–6 in subsessile abbreviated racemes. Pedicels slender, 2–3 lines. Calyx $2\frac{1}{2}$ lines. Corolla $\frac{3}{4}$ in. long, the standard concolorous or dotted. Pod reaching a foot long, the sutures and rounded valves thick; style $\frac{1}{2}$ in. or more long; seeds 20–30.—Guill. et Perr. Fl. Seneg. 200, t. 50.

Upper Guinea. Senegambia, *Leprieur and Perrottet!*
Nile Land. Nubia, *Kotschy! Binder.* Abyssinia, *Quartin-Dillon!*
Lower Guinea. Benguela, *Dr. Welwitsch!* (Prickly, with a shorter style.)

3. **S. cinerascens,** *Welw. mss.* A graceful much-branched slender shrub, 8–12 ft. high, with finely grey-downy branches. Petioles very short, unarmed. Upper leaves 4–6 in. long; leaflets 15–20-jugate, reaching 9–10 lines long, glaucous, puberulous. Peduncles 1–2 in. Racemes laxly 8–12-flowered, the lower pedicels 6–9 lines long, often cernuous. Calyx 2 lines deep; teeth very short, deltoid cuspidate. Corolla $\frac{5}{8}$ in. deep, the standard $\frac{5}{8}$ in. broad, copiously finely dotted with purple. Pod 9–12 in. long, $2\frac{1}{2}$ lines thick, tipped with a persistent style half an inch long, the moderately thick valves slightly torulose, not at all ribbed on the back; seeds 40–50.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

4. **S. ægyptiaca,** *Pers.; DC. Prod.* ii. 264. An erect copiously branched pale-green glabrous shrub, 5–8 or even 10 ft. high. Leaves nearly sessile, the unarmed rachis on the upper ones 2–4 in. long; leaflets 10–20-jugate, glabrous, glaucous-green, reaching an inch long, 2 lines broad, blunt with a faint mucro. Peduncles 1–2 in.; racemes lax, 6–12-flowered; pedicels spreading, 2–4 lines. Calyx 2 lines, glabrous, the teeth very short, deltoid cuspidate. Corolla bright yellow, $\frac{1}{2}$ in. long, the round emarginate standard $\frac{1}{2}$ in. broad, more or less dotted with purple. Pod 6–8 in. long, $1\frac{1}{2}$–2 lines thick, distinctly torulose, 20–30-seeded, the valves rounded on the back, not so thick as in *S. punctata* and *pachycarpa*. Wight. Ic. t. 32.—*S. picta*, Pers., Bot. Reg. t. 873 (flowers deeper coloured, more spotted than usual).

Upper Guinea. Senegambia, *Leprieur and Perrottet!* Guinea proper, *Dr. Vogel! Capt. Burton!* &c.
Nile Land. Upper Egypt, *Schimper! Dr. Bromfield!* Nubia, *Kotschy!* Banks of the White Nile, *Dr. Brownell!* 3° N. lat., where the herd-boys use the pod as a rattle, *Speke and Grant!*
Extends through Tropical Asia to North Australia, and often cultivated in European gardens.

5. **S. aculeata,** *Pers.; DC. Prod.* ii. 265. A slender glabrous annual 2–4 ft. high, with the branches and rachis of the leaves armed with small deciduous prickles. Leaves 6–12 in. long; leaflets 20–50-jugate,

reaching 12–15 lines long, glaucous, glabrous. Racemes more elongated and narrower than in the other species, and bracts more persistent. Lower pedicels 2–3 lines, usually ascending. Peduncles reaching 3–4 in., often muricated. Calyx $\frac{1}{8}$ in.; the teeth very short. Corolla pale yellow, $\frac{1}{2}$ in. long, concolorous or faintly dotted. Pod not seen in a mature state.—Harv. Fl. Cap. ii. 212. *S. mossambicensis*, Klotzsch in Peters' Mossamb. Bot. 45 (a slender unarmed form).

Upper Guinea. Senegambia, *Leprieur and Perrottet!* Guinea proper and Niger country, *Thonning, Dr. Vogel!* and others.
Mozamb. Distr. Mozambique, *Dr. Peters!* Tette, *Dr. Kirk!*
Reaches Natal, and extends through Tropical Asia to Australia.

6. **S. pubescens,** *DC. Prod.* ii. 265. A firm erect annual reaching a height of 2–4 ft. with densely grey-silky branches. Leaves short-stalked, the upper 3–4 in., the lower 8–10 in. long; leaflets 16–30-jugate, 12–15 lines long, 2–3 lines broad, densely grey-silky. Racemes $1\frac{1}{2}$–2 in. long, 6–15-flowered on short silky peduncles. Pedicels 2–3 lines. Calyx 2 lines, subglabrous, the deltoid teeth $\frac{1}{3}$–$\frac{1}{4}$ of the tube. Corolla $\frac{3}{8}$ in. Pod 5–6 in. long, 1 line thick, falcate, 20–30-seeded, not torulose when mature; valves thick, coriaceous.—Klotzsch in Peters' Mossamb. Bot. 44, t. 8.

Upper Guinea. Senegal, *Perrottet! Brunner!* and others. Guinea proper, *Thonning.*
Nile Land. Sennaar, *teste Schweinfurth.*
Lower Guinea. Loanda, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters.*

7. **S. leptocarpa,** *DC. Prod.* ii. 265. A slender erect glaucous glabrous annual, 2–3 ft. high. Petioles 2–3 lines unarmed. Upper leaves 2–3 in. long; leaflets 20–30-jugate, reaching $\frac{1}{2}$ in. long, glabrous, very glaucous. Flowers 1–3 on slender peduncles 6–12 lines long. Pedicels and glabrous calyx $\frac{1}{8}$ in. Corolla $4\frac{1}{2}$–5 lines, the standard blotched and finely dotted with purple. Pod 5–6 in. long, torulose, 20–24-seeded, with thin valves and dissepiments; style short.—*S. filiformis*, Hochst. in Kotschy, Hb. Nub. No. 47.

Upper Guinea. Senegambia, *Perrottet! Heudelot!*
Nile Land. Nubia, *Kotschy.*
Also a plant of Arabia.

8. **S. sphærosperma,** *Welw. mss.* A glabrous shrub 4–6 ft. high. Petioles very short, like the rachis slightly muricated. Leaves 4–5 in.; leaflets 25–30-jugate, reaching an inch long, glaucous, glabrous. Racemes 4–6-flowered, subsessile in the axils of the leaves, under an inch long. Pedicels 2–3 lines very slender. Calyx 1 line deep; teeth very short, deltoid. Corolla 4 lines long, paler than in the other species, the standard not dotted. Pod reaching 8–9 in. long, $\frac{1}{4}$ in. thick, the valves and dissepiment very thick, the latter angular on the back and marked with a distinct keel; seeds 40–50; style acutely conical.

Lower Guinea. Loanda, *Dr. Welwitsch!*

9. **S. tetraptera,** *Hochst. in Kotsch. Hb. Nub.* 131. Stems suffruticose, erect, the branches glabrous, terete, glaucous, somtimes with a few weak prickles like those of *S. aculeata*. Leaves subsessile, rachis 2–4 in. long, sometimes densely prickly like the branches towards the base; leaflets in 15–20 pairs, linear-oblong, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 2 lines broad; apex rounded, mucronate, texture firm, both sides glabrous and glaucous. Racemes 4–6-flowered, shorter than the leaves. Pedicels slender, glabrous, exceeding the calyx, which is 2 lines deep, the teeth deltoid, reaching a quarter of the way down. Corolla yellow, $\frac{1}{2}$ in. deep, the standard orbicular. Pod 5–6 in. long, glabrous, narrowed into a short pedicel, the body of the pod and each of the four wings a quarter of an inch broad.

Nile Land. Nubia, *Kotschy!*
The species is also in Kotschy's Ethiopian set, No. 83.

26. **COLUTEA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 505.

Calyx-teeth subequal or the two upper ones shorter. Standard suborbicular, spreading, with a short claw and two callosities above it; wings falcate-oblong, with short claws; keel broad, much incurved, obtuse, with two connate claws. Upper stamen free, the rest united in a sheath; anthers uniform. Ovary stalked, multiovulate; style incurved, longitudinally bearded upwards on the inner side, the point inflexed, the stigma thickened below the apex. Pod stalked, membranous inflated, not dehiscent or opening at the point.—Shrubs.

A small genus, principally distributed round the Mediterranean.

1. **C. haleppica,** *Lam.; DC. Prod.* ii. 270. A copiously branched shrub with glabrous subterete branches. Petiole $\frac{1}{2}$–$\frac{3}{4}$ in. long; rachis $1\frac{1}{2}$–2 in. long; leaflets in 4–6 pairs and a terminal one, short-stalked, obovate or oblong, 3–6 lines long by more than half as broad, apex rounded, mucronate, surfaces glabrous or slightly silky, pale-green. Racemes 2–3-flowered, shorter than the leaves. Calyx glabrous, campanulate, 2 lines deep, the teeth very short. Corolla yellow, $\frac{5}{8}$–$\frac{3}{4}$ in. deep. Pod oblong, narrowed at both ends, distinctly stalked, glabrous, 2–$2\frac{1}{2}$ in. long, 1 in. thick.—A. Rich. Fl. Abyss. i. 192. *C. Pocockii,* Ait. Hort. Kew. iii. 55.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Petit! Roth!*
Native name, Quaequaeta.
Inhabits also Asia Minor, Persia, and Arabia.

27. **LESSERTIA,** DC.; Benth. et Hook. f. Gen. Plant. i. 503.

Calyx campanulate with 5 subequal teeth. Petals all unguiculate; standard suborbicular, spreading or reflexed; wings oblong, shorter than the other petals; keel incurved obtuse. Stamens diadelphous; tube slit along the top; anthers uniform. Ovary stipitate, multiovu-

late; style filiform, penicillate in our species round the small round terminal stigma. Pod stipitate, membranous, oblong or linear, the valves flat in our species, finally dehiscing at the apex.—Herbs or undershrubs with imparipinnate leaves and racemose flowers.

A considerable Cape genus, of which we get a single outlying species.

1. **L. benguellensis,** *Baker.* An erect undershrub with stiff ascending branches canescent only on the petioles and slightly on the branchlets. Stipules setaceous, minute. Leaves shortly petioled, 3–4 in. long; leaflets 9–13, ligulate, pale-green, rather fleshy, reaching 8–10 lines long, truncate at the apex with a faint mucro. Flowers up to a dozen in copious moderately lax short-stalked racemes much shorter than the leaves. Calyx glabrous, 1 line long. Corolla 4 lines, greenish-yellow, the wings reflexed and standard streaked with purple. Pod with a pedicel which exceeds the calyx, oblong, glabrous, 12–15 lines long, 8–9 lines broad, 6–7-seeded.

Lower Guinea. Mossamedes, Benguela, amongst red sandstone rocks at the base of the Sierra de Montes Negros, *Dr. Welwitsch!*

28. **ASTRAGALUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 506.

Calyx tubular, the teeth subequal. Petals with long claws; standard erect, ovate-oblong or panduriform; wings oblong; keel equalling the wings or slightly shorter, obtuse, nearly straight. Upper stamen free, the rest connate; anthers uniform. Ovary sessile or stalked, multiovulate; style filiform, straight or incurved, glabrous, with a small terminal stigma. Pod sessile or stalked, two-valved, often more or less completely divided longitudinally by a membranous dissepiment arising from the dorsal suture.—Herbs or undershrubs.

A very large genus, with its head-quarters in the Western half of Asia, with many species in Eastern Asia, Europe, and round the shores of the Mediterranean, a few in the Andes and Temperate South America, and one in Natal.

Pods compressed, the longitudinal dissepiments complete (*Diplotheca*, Hochst.).
- Stipules ½–¾ in. long, ¼ in. broad . . . . . 1. *A. venosus.*
- Stipules 1–1½ in. long, ¾–1 in. broad . . . . . 2. *A. abyssinicus.*

Pods turgid, internal dissepiment very incomplete . . . . . 3. *A. prolixus.*

1. **A. venosus,** *Hochst. in Schimp. Hb. Abyss.* No. 190. Stems herbaceous, erect, 2–3 ft. high, copiously and diffusely branched, the branches glabrous or slightly silky. Stipules cordate-acuminate, unequal-sided, ½–¾ in. deep, ¼ in. broad, free to the base. Leaves nearly sessile; rachis 2–6 in. long; leaflets in 10–12 pairs, linear-oblong, ½–¾ in. long, 1–3 lines broad, short-stalked, apex rounded, mucronate, both sides pale-green, glabrous or slightly grey-downy. Racemes 20–40-flowered, ultimately 3–6 in. long, on glabrous erect peduncles 1–3 in. long. Pedicels very short. Bracts linear, half as long as the

calyx, which is $\frac{1}{8}$ in. deep, rather oblique, the lower teeth lanceolate, reaching a third down, the upper shorter. Corolla bright yellow, three times as long as the calyx. Pod linear, $\frac{3}{4}$ in. long, 2 lines broad, distinctly stalked, the longitudinal dissepiments complete, the valves compressed, membranous, glabrous, finely wrinkled transversely, seeds 2–4 in each cell.—*A. tigrensis*, Hochst. in Schimp. Hb. Abyss. No. 241. *Diplotheca venosa*, *atropilosula* and *tigrensis*, Hochst. in Flora. 1846, 596.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit! Roth!* Uganda, in plantain groves, *Speke and Grant!*

Cultivated as food for horses. Native name *Hamat quaequaeta*, or *hamat kochata.*

2. **A. abyssinicus,** *Steud. in Schimp. Hb. Abyss.* No. 232. Stems firm, erect, 3–4 ft. or more high, sparingly branched, the branches firm, glabrous, terete. Stipules cordate acuminate, unequal-sided, 1–1$\frac{1}{2}$ in. long, $\frac{3}{4}$–1 in. broad, free to the base. Leaves nearly sessile, rachis 2–6 in. long, leaflets in 10–15 pairs, linear-oblong, $\frac{3}{4}$–1 in. long, 2–4 lines broad, glabrous, glaucous-green. Flowers in dense racemes ultimately 4–6 in. long on short erect glabrous peduncles. Bracts linear, exceeding the cernuous pedicels, which are 1$\frac{1}{2}$–2 lines long. Calyx $\frac{1}{4}$ in. deep, the lower teeth linear, reaching halfway down, the upper ones deltoid. Corolla bright yellow, half an inch deep. Pod as in *A. venosus*, but rather longer, the seeds 4–5 in each cell.—*Diplotheca abyssinica*, Hochst. in Flora 1846, 595.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*

3. **A. prolixus,** *Sieb. in Pl. Ægypt. Exsicc.* Stems annual, procumbent, a foot or more long, copiously and diffusely branched from the base, the branches slender, finely grey-silky. Stipules lanceolate, 2 lines deep, free to the base. Leaves sessile; rachis 1–1$\frac{1}{2}$ in. long; leaflets in 5–6 pairs, oblanceolate or oblong, $\frac{1}{4}$ in. long by about half as broad, both sides densely grey-silky. Racemes 6–12-flowered, ultimately equalling or exceeding the leaves. Bracts setaceous, exceeding the short pedicels. Calyx tubular, a line deep, silky, the teeth linear or lanceolate, reaching about a quarter of the way down. Corolla yellowish, not much exceeding the calyx. Pod oblong, very turgid, $\frac{1}{4}$ in. long by half as broad, silky, the dissepiment produced about halfway through in the lower part, seeds 2–3 in each cell.—*Phaca Vogelii*, Webb in Fl. Nigr. 123, t. 8.

Nile Land. Banks of the Nile within the Tropic, *Ehrenberg, Dr. Bromfield!* Abyssinia, *Schimper!*

Extends from the Cape Verde islands to Arabia.

29. **BISERRULA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 507.

Calyx-teeth subequal. Petals shortly unguiculate; standard erect, oblong; wings falcate-oblong, free; keel equalling the wings, obtuse. Upper stamen free, the rest connate; anthers uniform. Ovary sessile,

multiovulate; style short, thickened, incurved, stigma capitate. Pod linear, indehiscent, flattened on the back, compressed vertically, the valves each with a sinuate-dentate keel down the centre.

A single species.

1. **B. Pelecinus,** *Linn.; DC. Prod.* ii. 307. Stems annual, weak, erect, branched, 4–6 in. high, the branches slender, densely grey-pubescent. Leaves short-stalked; the rachis 1–1½ in. long; the leaflets in 8–12 pairs, oblanceolate, 2–3 lines long, thinly grey-silky. Flowers 1–3 together on pubescent slender erect peduncles, equalling or exceeding the leaves. Calyx a line deep, silky, the teeth linear, reaching nearly halfway down. Corolla cream-coloured, 2–2½ lines deep. Pods glabrous, ¾ in. long, ¼ in. broad. *B. leiocarpa*, Hochst. in Schimp. Hb. Abyss. 1762. A. Rich. Fl. Abyss. i. 194.

Nile Land. Abyssinia, *Schimper !*

Our description is taken entirely from these specimens, but we cannot distinguish the plant as a species from the well known Mediterranean one.

30. **SCORPIURUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 508.

Calyx campanulate, the two upper teeth connate. Petals unguiculate; keel incurved, rostrate. Stamens diadelphous; alternate filaments dilated; anthers uniform. Ovary sessile, cylindrical, multiovulate. Pod subterete, circinate, ribbed, articulated, indehiscent. Seeds subglobose or oblong.—Annuals with simple leaves narrowed into a petiole.

A small genus belonging to the Mediterranean Flora.

1. **S. sulcata,** *Linn.; DC. Prod.* ii. 308. Stems a foot long, diffuse, subglabrous. Leaves rather fleshy, 2–3 in. long. Flowers 3–6 on short pedicels in umbellate clusters on long axillary peduncles. Calyx ⅛ in. long. Corolla yellow, twice the calyx. Pod 1–2 in. long, with one or two spirals, distinctly constricted at the joints, muricated, the prickles of the upper row as long as the breadth of the pod.—*S. echinata*, A. Rich. Fl. Abyss. i. 290. *S. subvillosa*, Hochst. et Steud. in Schimp. Hb. Abyss. 1871.

Nile Land. Abyssinia, *Schimper ! Quartin-Dillon !*

All round the Mediterranean.

31. **ORNITHOPUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 509.

Calyx tubular, teeth nearly equal. Standard suborbicular; wings oblong; keel nearly straight, obtuse, shorter than the wings. Upper stamen free, the rest connate; alternate filaments dilated upwards; anthers uniform. Ovary sessile, multiovulate; style inflexed; stigma capitate. Pod linear, terete in our plant, recurved, the globose turgid

articulations very distinct. Umbels usually bracteate but not so in our plant.—Slender herbs with minute flowers.

A small genus, principally European and Mediterranean.

1. **O. coriandrinus,** *Hochst. in Schimp. Hb. Abyss. No.* 113. Stems annual, erect, copiously branched from the base, branches slender, slightly pubescent. Leaves sessile; rachis about $\frac{1}{2}$ in. long; leaflets 7–9, opposite or alternate, narrowly oblanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$–$\frac{3}{4}$ line broad, slightly silky, rachis with two small glands at the base in place of stipules. Umbels 2–4-flowered, on glabrous erect peduncles which about equal the leaves. Pedicels equalling the calyx, which is a line deep, the teeth setaceous, reaching halfway down. Corolla slightly exceeding the calyx. Pod $\frac{3}{8}$–$\frac{1}{2}$ in. long, slightly recurved, with 3–4 globose articulations separated by very narrow septa.—Field. et Gardn. Sert. Plant. i. 49. *Antopetitia abyssinica*, A. Rich. et Quart. Dill. Dec. Pl. Abyss. in Ann. Sc. Nat. sér. ii. 14, 261, t. 15 fig. 1. A. Rich. Fl. Abyss. i. 209.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*

32. **TAVERNIERA,** DC.; Benth. et Hook. f. Gen. Plant. i. 511.

Calyx with a campanulate tube and five subequal teeth. Standard obovate-cuneate; wings small; keel as long as the standard, obliquely truncate at the apex. Upper stamen free at the base or altogether; anthers uniform. Ovary stalked, 1–3-ovulate; style filiform, inflexed; stigma terminal. Pod flattened, composed of 1–3 indehiscent 1-seeded joints.—Shrubs with carnoso-herbaceous deciduous simple or pinnately trifoliolate leaves and marcescent flowers.

A desert genus extending from Egypt and Abyssinia to the North-west of India.

Leaves trifoliolate	1. *T. lappacea.*
Leaves usually or always simple.	
Pod densely bristly on the faces.	
Flowers 1–2 on a peduncle $\frac{1}{3}$ in. long	2. *T. ægyptiaca.*
Flowers 2–6 on a peduncle 1–1$\frac{1}{2}$ in. long	3. *T. Schimperi.*
Pod clothed with white silky hairs	4. *T. abyssinica.*

1. **T. lappacea,** *DC. Prod.* ii. 339. Stems procumbent, suffruticose, divaricately branched, terete. Leaves trifoliolate; leaflets fleshy, obcordate, villous. Flowers yellowish, 1–2, axillary, shortly stalked. Joints of the pod rough with rigid bristles hooked at the apex.

Nile Land. Nubia, (*teste Schweinfurth.*)

2. **T. ægyptiaca,** *Boiss. Diagn.* ix. 113. An excessively branched low shrub with slender virgate subglabrous twigs. Leaves all simple, obovate-cuneate, subglabrous, 2–3 lines long, on slender petioles under a line long. Flowers 1–2 together on an axillary silky peduncle $\frac{1}{8}$ in. long. Pedicel very short, finely silky. Calyx 1$\frac{1}{2}$–2 lines deep, subglabrous, the linear teeth equalling the tube. Corolla red, 5 lines deep,

the standard 4 lines broad. Pod shortly stipitate, 4–6 lines long, $\frac{1}{8}$ in. broad, with 2–3 joints, densely bristly on the faces.

Nile Land. Nubia, (*teste Schweinfurth.*)

3. **T. Schimperi,** *Jaub. et Spach. Illust. Pl. Or.* t. 474. A copiously branched shrub 2 or 3 ft. high with erecto-patent terete subglabrous branches. Leaves usually simple, casually pinnately trifoliolate, the petiole $\frac{1}{2}$ in. long, finely silky, geniculate and articulated at the apex, blade obovate, $\frac{3}{4}$–1 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, the apex rounded, both sides glabrous and glaucous. Stipules connate into a single small bifid brown scarious deltoid sheath round the base of the petiole. Flowers very deciduous, in 2–6-flowered racemes on rigid erecto-patent peduncles 1–1$\frac{1}{2}$ in. long from the axils of the leaves. Pedicels glabrous, equalling the campanulate calyx, which is 2 lines deep, the teeth linear or lanceolate, reaching halfway down. Corolla rose-red, persistent, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, the standard $\frac{1}{2}$ in. broad, the wings not more than 2 lines deep by half as broad. Pod $\frac{1}{4}$–$\frac{3}{8}$ in. long, with two or three articulations, densely muricated with long bristles all over the surface.—*T. cyclophylla*, Hochst. in Schimp. Hb. Abyss. 2329. *T. floribunda*, Schweinf. Fl. Æthiop. 17.

Nile Land. Abyssinia, *Schimper!*

4. **T. abyssinica,** *A. Rich. Fl. Abyss.* i. 206. A much branched shrub with terete pubescent branches. Leaves simple, small, short-stalked, obovate or obovate-oblong, glabrous above, paler and grey-silky beneath, the stipules as in the preceding. Flowers reddish, in few-flowered short-stalked axillary racemes. Calyx silky, the teeth narrow, acute. Pod linear, with 2–3 joints, clothed with white silky hairs.—*Onobrychis simplicifolia*, R. Br. in Salt, App. lxv. ?

Nile Land. Abyssinia, *Petit.*

33. ONOBRYCHIS, Gærtn.; Benth. et Hook. f. Gen. Plant. i. 511.

Calyx-teeth subulate. Standard obovate, narrowed at the base, scarcely unguiculate; wings small; keel obtuse, equalling or longer than the standard. Upper stamen free at the base, connate with the others at the middle in a closed tube; anthers uniform. Ovary sessile, 1–2-ovulate. Style filiform, inflexed, with a small terminal stigma. Pod subcompressed, half or quite orbicular, inarticulated, indehiscent; seeds 1–2.—Herbs or undershrubs.

A large genus, principally Mediterranean.

1. **O. Richardi,** *Baker.* Stem herbaceous, erect, densely clothed with white tomentum. Stipules lanceolate, scarious. Leaves long-stalked, the leaflets lanceolate or sublinear, glabrous above, silky beneath principally on the edge and veins. Racemes long-stalked, equalling the leaves when in flower, twice as long when in fruit. Pods suborbicular, emarginate at the base, densely setose-tomentose,

echinate on the edge and both faces.—*O. eriophora*, A. Rich. Fl. Abyss. i. 206 non Desv. et DC.

Nile Land. Abyssinia, *Petit.*

We have not seen this, and take our account of it from A. Richard. It cannot be *O. eriophora*, which is a native of Spain, and has the stem glabrous below, thinly silky upwards, with woolly pods only half-orbicular, half an inch broad without the spines, and the spines of the edge a quarter of an inch long, and flowers half an inch deep. We do not know of any described species to which it can be referred.

34. **ALHAGI**, Desv.; Benth. et Hook. f. Gen. Plant. i. 512.

Calyx campanulate, the teeth very short, subequal. Petals equal; standard obovate, shortly clawed; keel incurved, obtuse. Upper stamen free; filaments filiform; anthers uniform. Ovary subsessile, multiovulate; style filiform, incurved, glabrous, stigma terminal. Pod linear, subterete, smooth, indehiscent, many-seeded, contracted and septate between the seeds, the articulations not separating spontaneously.—Rigid, much-branched, spiny shrubs, with simple leaves.

A small desert species, extending eastward to Songaria and N.W. India.

1. **A. maurorum,** *Desv.; DC. Prod.* ii. 352. An erect wiry much-branched glabrous shrub, 1–3 ft. high, armed with copious pungent spreading spines an inch or more long. Leaves simple, drooping from the base of the spines and branches, obovate-oblong, entire, 1–3 lines long, short-stalked, deciduous. Flowers solitary or in few-flowered secund racemes from the spines on short pedicels. Calyx $\frac{1}{8}$ in. deep, the teeth deltoid, acute. Corolla red, three times the calyx. Pod sickle-shaped, an inch or more long.

Nile Land. Nubia, *Caillaud.*

The common species of the Syrian and Egyptian deserts.

35. **ORMOCARPUM**, Beauv.; Benth. et Hook. f. Gen. Plant. i. 515.

Calyx five-toothed, two upper lobes subconnate. Standard orbicular, unguiculate; wings obliquely obovate; keel broad, incurved, obtuse or subacute, equalling the wings. Stamens all united in a sheath, which is slit above and afterwards also often below; anthers uniform. Ovary multiovulate; style much inflexed, filiform; stigma minute, terminal. Pod linear, compressed, longitudinally sulcate-striate, the faces often papillose or muricated, the articulations oblong, narrowed to both ends.—Tall, often glutinous shrubs.

A small genus, belting the world in the Tropics.

Leaves simple; petiole articulated . . . . . 1. *O. verrucosum.*
Leaves compound; petiole not articulated.
  Flowers in lax racemes. Corolla small, yellow, fading . . 2. *O. sennoides.*
  Flowers arising singly from the branches. Corolla large, reddish, persistent . . . . . 3. *O. bibracteatum.*

1. **O. verrucosum,** *Beauv.; DC. Prod.* ii. 315. A tree or tall shrub with glossy brown glabrous woody branches. Stipules minute, lanceo-

late cuspidate. Petioles $\frac{1}{4}$–$\frac{3}{4}$ in. long, articulated at the apex, glabrous. Leaves simple, ovate acuminate, 3–4 in. long, when full grown, by $1\frac{1}{2}$–2 in. broad, both sides glabrous, the upper one dark green, veins slightly prominent. Flowers 1–4, laxly racemose, on a peduncle about half an inch long from the axils of the leaves. Bracts lanceolate, small. Pedicels slender, glabrous, about equalling the glabrous calyx, which is 2 lines deep, the lower teeth lanceolate, reaching about halfway down, the two upper ones shorter and subconnate. Corolla rose-coloured, twice as long as the calyx, deciduous. Pod 2 in. or more long, with 2–4 articulations, which are $\frac{3}{4}$ in. long by $\frac{1}{4}$ in. broad, narrowed to both ends, the lowest distinctly stalked, polished, olive-grey, with prominent longitudinal lines and a few scattered papillæ.

Upper Guinea. Guinea proper, *Beauvois*, *Vogel!* and others. Senegambia, *Heudelot!*

2. **O. sennoides,** *DC. Prod.* ii. 315. A much branched shrub, 4–6 ft. high, with glabrous terete branches. Stipules small, spreading, lanceolate acuminate. Petiole $\frac{1}{4}$–$\frac{3}{8}$ in. long, glabrous or glandular. Rachis 2–3 in. long, leaflets 13–17, oblanceolate, $\frac{3}{4}$–1 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, the apex rounded and mucronate, short-stalked and very deciduous, under surface subglaucous. Flowers in lax axillary 3–6-flowered racemes, which are shorter than the leaves. Bracteoles small, lanceolate, scarious. Pedicels $\frac{1}{4}$–$\frac{3}{8}$ in. long, slender, glabrous or slightly glandular. Calyx $\frac{1}{4}$ in. deep, campanulate, the lower teeth lanceolate, reaching halfway down, the two upper ones subconnate. Corolla yellow, with reddish striæ, twice as long as the calyx, deciduous. Pod distinctly stalked, pointed, with 2–6 articulations, which are $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad, glabrous.—*O. coronilloides*, G. Don, Gard. Dict. ii. 279. *Rathkea glabra*, Schum. et Thonn. Pl. Guin. 355. *Æschynomene coluteoides*, A. Rich. Sert. Astrol. 87 t. 32.

Upper Guinea. Guinea proper, *Thonning*. Sierra Leone, *Afzelius! Dr. Macwilliam!* Island of St. Thomas, *G. Don!*

Lower Guinea. Golungo Alto, Casengo and Loanda, *Dr. Welwitsch!*

Extends through Tropical Asia to Australia. The ordinary Indian form has the pod glandulose-muricated on the faces, but we have the African form from Ceylon, Loo Choo isles, Siam, and North Australia.

3. **O. bibracteatum,** *Baker*. A shrub or tree with thick, woody, grey terete branches. Stipules $\frac{1}{4}$ in. deep, lanceolate, scarious, conspicuously veined. Leaves crowded, subsessile, the rachis 2–3 in. long, the leaflets in 6–8 pairs and a terminal one, oblong, $\frac{1}{4}$–$\frac{3}{8}$ in. long by less than half as broad, the apex rounded and mucronate, texture firm, rachis and under surface thinly silky, only the midrib prominent. Flowers crowded on the woody twigs, solitary or in pairs. Pedicels slender, erect, grey-silky, with a pair of opposite spreading ovate-lanceolate bracteoles below the calyx and sometimes others lower down. Calyx campanulate, becoming submembranous, brownish and silky, $\frac{1}{4}$–$\frac{3}{8}$ in. deep, the upper teeth oblong-deltoid and blunt, reaching nearly halfway down, the lowest longer and more pointed. Corolla reddish,

$\frac{3}{8}$–$\frac{7}{8}$ in. deep, becoming subscarious, veined and persistent as in *Tavorniera*; the standard $\frac{3}{4}$ in. broad, the wings $\frac{3}{8}$ in. broad, the keel $\frac{3}{4}$ in. round. Pod $\frac{3}{4}$–1 in. long, with two articulations, downy and venose but not papillose.—*Acrotaphros bibracteata*, Hochst. et Steud. in Schimp. Hb. Abyss. 1298. A. Rich. Fl. Abyss. i. 207 t. 38.

Upper Guinea. Senegambia, *Heudelot!*
Nile Land. Abyssinia, *Salt, Schimper! Quartin-Dillon and Petit!*
Native name Alaudia.

A plant gathered by Dr. Kirk in the country on the west of Lake Nyassa, with the calyx of *Ormocarpum*, the pod of *Æschynomene*, and the tube of the stamens slit above only, and the upper one free, is probably the type of a new genus, but our single specimen is too imperfect to decide upon. The following are its further characters. Branches woody, slender, clothed with short grey pubescence. Flowers in fascicles of 2–5 from the twigs. Pedicels pubescent, equalling the broadly campanulate calyx, which is 3 lines deep, the teeth reaching about halfway down, the two upper ones connate. Corolla reddish, twice as long as the calyx; the standard orbicular erect; wings small and much shorter than the other petals; keel $\frac{1}{4}$ in. deep, not rostrate. Pod with a curious slender decurved pedicel more than an inch long, the articulations 2–4, oblong, each 3–4 lines long, both sutures, especially the lower one, wavy, so that the constrictions are not more than half as broad as the articulations, the style persistent, the faces flat, and, like the pedicel, densely clothed with soft short yellowish silky hairs.

36. **HERMINIERA**, Guill. et Perr.; Benth. et Hook. f. Gen. Plant. i. 515.

Calyx deeply divided into two subentire lips. Standard orbicular, shortly unguiculate; wings obliquely obovate broad about equalling the standard; keel broad, obtuse or obliquely subrostrate, its petals easily separating. Stamens in two bundles of five each; anthers uniform. Ovary stalked, multiovulate; style filiform; stigma terminal, minute. Pod broad, linear, nearly flat, spirally curved, the square articulations finally separating.

A single species, confined to Tropical Africa.

1. **H. Elaphroxylon,** *Guill. et Perr. Fl. Seneg.* 201, t. 51. An erect shrub 8–20 ft. high, with spinose woody branches densely clothed with weak spreading yellowish bristles. Thorns $\frac{1}{8}$–$\frac{1}{4}$ in. long, principally in pairs at the base of the leaves, horny, yellowish, subconical. Stipules ovate-lanceolate, membranous, deciduous. Leaves nearly sessile, the rachis 3–4 in. long, bristly and acicular; leaflets in 10–20 pairs, linear-oblong, 4–6 lines long, 2–3 lines broad, the apex rounded and sometimes emarginate, texture firm, colour pale glaucous-green, upper surface glabrous, lower scabrous with small bristly hairs. Flowers 1–3, subcorymbose on short bristly peduncles. Calyx $\frac{3}{4}$–1 in. deep, the lips ovate, unequal, the upper the shortest. Corolla bright orange, $1\frac{1}{2}$ in. deep, the standard $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad, the keel $\frac{5}{8}$ in. deep and wings $\frac{7}{8}$ in. broad. Pod 2 in. or more long, 3–4 lines broad, 12–15-articulated, once or more spiral, the sutures hardly at all waved, the faces nearly flat, finely pubescent.—Walp. Rep. 5. 516. *Ædemone*, Kotschy in Œsterr. Bot. Monat. 1858, t. 1.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Leprieur!* Guinea, *Barter!*
Nile Land. Banks of White Nile, *Dr. Brownell! Petherick! Speke and Grant!*
Lower Guinea. Angola and Benguela, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk! Dr. Meller!*

Grows in or near water. Very ornamental, from its large bright-coloured flowers.

"The 'Ambash,' or pith tree of the Nile, from 3° to 8° N. lat. Natives use its light logs to assist them in swimming across the river. It grows so rapidly that in three years it almost choked up the channel of the Bahr el Gazelle."—*Grant.*

H. excelsa, Kotschy, from the White Nile country, and *H. humilis*, Kotschy, from Sennaar, are known to us by name only.

37. **ÆSCHYNOMENE**, Linn.; Benth. et Hook. f. Gen. Plant. i. 515.

Calyx deeply bilabiate, the divisions entire or shortly toothed. Standard roundish with a short claw; wings obovate-oblong, about equal to the standard; keel more or less incurved. Staminal tube slit either below or both below and above; anthers uniform. Ovary stalked, 1–2- or multiovulate; style incurved beardless; stigma terminal. Pod stalked, the articulations finally separating, smooth or muricated on the flat or slightly convex faces.—Undershrubs or herbs with usually very numerous crowded small more or less sensitive leaflets and fugacious flowers.

A middle-sized genus, belting the world in the tropics.

§ **Euæschynomene proper.**—Stipules with a distinct spur. Ovary multiovulate.

Leaflets membranous; stipules caducous.
Flowers solitary or casually geminate.
Articulations of pod 1–4 . . . . . 1. *Æ. papulosa.*
Articulations of pod 5–8.
Sutures hardly at all indented . . . . . 2. *Æ. oligantha.*
Sutures distinctly indented . . . . . 3. *Æ. uniflora.*
Articulations of pod 10–15 . . . . . 4. *Æ. Schimperi.*
Flowers 2–4 in lax corymbose racemes.
Lower suture deeply indented . . . . . 5. *Æ. sensitiva.*
Lower suture very slightly indented.
Corolla 4–6 lines long . . . . . 6. *Æ. indica.*
Corolla 8–9 lines long . . . . . 7. *Æ. aspera.*
Leaflets rigidly coriaceous; stipules persistent . . . . . 8. *Æ. acutangula.*

§§ **Ochopodium** (Vogel).—Stipules not spurred at the base. Ovary 1–2 ovulate; the pod often reduced to a single joint.

Flowers in terminal racemes separate from the leaves.
Leaflets 10–15-jugate, 1–1½ lines long . . . . . 9. *Æ. pygmæa.*
Leaflets 6–9-jugate, 6–9 lines long . . . . . 10. *Æ. glabrescens.*
Flowers all in axillary racemes.
Leaflets 3–6-jugate; corolla minute . . . . . 11. *Æ. pulchella.*
Leaflets 8–12-jugate; corolla middle-sized . . . . . 12. *Æ. Ruppellii.*
Leaflets 20–35-jugate; corolla large . . . . . 13. *Æ. julgida.*
Racemes copious, both terminal and lateral, all simple.
Bracteoles at base of pedicels very persistent . . . . . 14. *Æ. bracteosa.*
Bracteoles all very fugacious . . . . . 15. *Æ. tenuirama.*
Racemes copious, both terminal and lateral, some forked . . 16. *Æ. debilis.*
Flowers in large terminal panicles, only the lower branches subtended by leaves.
Leaflets dimidiate, the midrib close to the upper edge . . 17. *Æ. dimidiata.*
Leaflets equal-sided, the midrib central . . . . . 18. *Æ. sifolia.*

1. **Æ. papulosa,** *Welw. mss.* An annual or biennial with the habit of *Æ. indica*, the younger branches densely bristly. Stipules lanceolate, spurred, $\frac{1}{8}$ in. long, caducous. Petioles $\frac{1}{8}$ in. densely bristly; rachis 9–12 lines; leaflets 6–12-jugate, linear-oblong, sensitive, 2–3 lines long, glaucous beneath. Flowers solitary on viscid bristly bractless slender peduncles 1–6 lines long. Calyx $\frac{1}{2}$ in. deep, split down to the base, with two minute lanceolate bracteoles. Corolla scarcely exceeding the calyx. Pod 2 lines broad, at most an inch long, with 1–4 densely muricated articulations, the upper suture slightly, the lower more indented; pedicel twice the calyx.

Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*

2. **Æ. oligantha,** *Welw. mss.* A copiously branched shrub 3–4 ft. with very slender flexuose almost scandent branches, only the very youngest slightly bristly. Stipules lanceolate, spurred, $\frac{1}{8}$ in. long, very deciduous. Petioles very short, finely setose; rachis 6–18 lines; leaflets 12–18-jugate, linear-oblong, 2–$2\frac{1}{2}$ lines long, $\frac{1}{2}$ line broad, pale green, sensitive, glabrous. Flowers solitary (very rarely two) on flexuose bristly peduncles 6–15 lines long with 1–3 pairs of unequal-sided ovate acuminate toothed bracts. Calyx $2\frac{1}{2}$ lines deep, cleft down to the base. Corolla pale yellow, half as long again as the calyx. Pod linear, an inch long, $\frac{1}{8}$ in. broad, smooth on the faces, 5–6-jointed, with a pedicel twice the calyx, the upper suture not at all, the lower very slightly indented.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch!*

3. **Æ. uniflora,** *E. Meyer, Comm.* 123. Slightly shrubby, the branches densely bristly. Stipules lanceolate, $\frac{1}{4}$–$\frac{3}{8}$ in. caducous. Petioles 2–3 lines, bristly; rachis 2–3 in.; leaflets 10–20-jugate, sensitive, glaucous, linear-oblong, 3–4 lines long. Flowers 1 or casually 2 on a viscid bristly peduncle 6–12 lines long. Calyx $\frac{1}{4}$ in., bristly, cleft down to the base. Corolla pale yellow, half as long again as the calyx. Pod $1\frac{1}{2}$–2 in. long, $2\frac{1}{2}$ lines broad, nearly straight; articulations 6–8, much raised and rugose on the faces, falling easily; both sutures, especially the lower one, distinctly indented; pedicel bristly, exceeding the calyx.—Harv. Fl. Cap. ii. 226.

Upper Guinea. At the confluence of the branches of the Niger, *Barter!*
Mozamb. Distr. Island of Pemba, north of Zanzibar, *Bojer!*
Also a plant of the Comoros and Natal.

4. **Æ. Schimperi,** *Hochst. in Schimp. Hb. Abyss.* No. 202. An annual 2–3 ft. high with densely bristly pale grey branches. Stipules $\frac{1}{4}$–$\frac{5}{8}$ in. lanceolate, spurred, caducous. Petioles 2–3 lines, bristly; rachis 2–4 in.; leaflets 12–30-jugate, sensitive, glaucous, linear-oblong, 4–6 lines long. Flowers 1–2 on bristly axillary peduncles an inch or less long. Calyx 4–5 lines, densely bristly, split down to the base. Corolla 6–8 lines, with a round standard 6–8 lines broad. Pod 2–$2\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, smooth or bristly; articulations 10–15, hardly at all raised on the face or indented at either suture; pedicel 4–6 lines.

Nile Land. Banks of the White Nile, *Binder*. Abyssinia, *Schimper! Quartin-Dillon! Parkyns!*

No. 615 of Speke and Grant's collection is probably distinct, but the specimen does not furnish any character to separate it clearly. Their note upon it is—"A high bushy tree; Waganda make shields of its light wood; Wanyaro use it as trimmers and door-bolts; Wanyamuezi as load-levers."

5. **Æ. sensitiva,** *Swartz; DC. Prod.* ii. 320. A shrub with glabrous or slightly viscid terete slender branches. Stipules $\frac{1}{4}$–$\frac{3}{8}$ in. lanceolate caducous. Petioles short, viscid, the rachis $1\frac{1}{2}$ in. long; leaflets in 15–20 pairs, linear-oblong, 3–4 lines long, 1 line broad, glabrous, glaucous, sensitive. Flowers 2–4 in very lax corymbs with leaves from the lower nodes. Bracts ovate, membranous like the stipules. Pedicels viscous. Calyx 2 lines deep, cleft nearly to the base. Corolla yellow, not more than $\frac{1}{4}$ in. deep. Pod $1\frac{1}{2}$–2 in. long, 6–9-jointed, the lowest articulation on a pedicel $\frac{1}{4}$ in. long, the upper suture nearly straight, lower deeply indented, both considerably thickened, the face in our plant with a few scattered setæ.

Upper Guinea. Senegambia, *Heudelot!*

A common American plant, extending from the West Indies to Brazil.

6. **Æ. indica,** *Linn.; DC. Prod.* ii. 320. An annual or biennial 1–3 ft. high, with pale glabrous or casually slightly bristly branchlets. Stipules lanceolate, $\frac{1}{4}$–$\frac{1}{2}$ in. with a lanceolate spur, caducous. Petioles 2–3 lines; rachis $1\frac{1}{2}$–3 in. long; leaflets 15–20-jugate, linear-oblong, 2–4 lines long, sensitive, glaucous below. Flowers 2–4 in lax short-peduncled racemes. Bracts ovate-lanceolate, membranous, 1–$1\frac{1}{2}$ lines. Pedicels $1\frac{1}{2}$–3 lines. Calyx 2–$2\frac{1}{2}$ lines, cleft down to the base. Corolla pale yellow, very fugacious, half as long again as the calyx. Pod 12–15 lines long, $\frac{1}{8}$ in. broad, recurved, the upper suture not at all, the lower very little indented; articulations 6–10, smooth or slightly rugose on the faces; pedicel exceeding the calyx.—*Æ. sensitiva*, Beauv. Fl. Owar. 89, t. 53, non Swartz. *Æ. macropoda*, DC. Prod. loc. cit. *Æ. quadrata*, Schum. et Thonn. Pl. Guin. 356.

Upper Guinea. Senegambia, *Heudelot! Perrottet!* Gold Coast, *Beauvois, Thonning, Vogel!* and others.

Nile Land. Kordofan, *Kotschy!* In marshes generally from 5° S. to 2° N., *Speke and Grant!*

Lower Guinea. Ambaca, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

7. **Æ. aspera,** *Linn.; DC. Prod.* ii. 320. Stems erect, annual or biennial, 3–4 ft. high, herbaceous, but sometimes $\frac{1}{4}$ in. thick at the base, filled with soft white pith, usually glabrous. Stipules lanceolate, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Petioles $\frac{1}{2}$–1 in. long, glabrous. Rachis 3–6 in. long, the sensitive membranous leaflets in 30–50 pairs, linear-oblong, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad. Flowers in lax corymbs of 2–4 each on short peduncles from the axils of the leaves. Pedicels slender, glabrous, or slightly bristly. Bracts ovate, membranous. Calyx bristly, $\frac{1}{4}$ in. deep, cleft nearly to the base. Corolla 8–9 lines long, yellow, hairy on the outside. Pod 2–3 in. long, $\frac{1}{4}$ in. broad, with 6–8 articulations,

the lowest with a long stalk, the borders hardly at all wavy, the faces smooth or muricated.—*Æ. indica*, β *aspera*, Hassk. Pl. Jav. Rar. 340.

Upper Guinea. Guinea proper, *G. Don! Vogel!*
Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, Elephant marsh, banks of the Shire, *Dr. Kirk!*
Scarcely more than a variety of the preceding, but larger, with a hairy calyx and corolla, and a somewhat different legume.

8. **Æ. acutangula,** *Welw. mss.* A glaucous glabrous undershrub 2–3 ft. high with strong triquetrous striated branches. Stipules lanceolate, rigidly coriaceous, persistent, 6–10 lines long, with a lanceolate spur 1½–2 lines deep. Petioles 3–6 lines, glabrous; rachis 2–3 in.; leaflets 12–15-jugate, linear-oblong, 6–9 lines long, 1½–2 lines broad three-quarters of the way up, rigidly coriaceous, prominently veined, turning black when dried. Flowers in copious terminal panicles that reach a foot long, with lax erecto-patent viscous branchlets. Pedicels erecto-patent, very slender, 2–3 lines. Calyx 2–2½ lines deep, split down to the base. Corolla yellow, twice the calyx. Pod with 1, or rarely 2 hemispherical articulations rounded on the lower side, 2 lines broad, smooth on the face. Pedicel as long as the calyx.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*
A very distinct species, connecting the two subgenera, as it combines the spurred stipules of *Euæschynomene* with the leaves and pod of *Ochopodium*.

9. **Æ. pygmæa,** *Welw. mss.* A minute undershrub not more than 3–6 in. high, with densely cæspitose erect stems copiously clothed with short grey bristles. Stipules linear, 1½–2 lines, rigidly coriaceous. Leaves subsessile; rachis 3–6 lines long, densely bristly; leaflets 10–15-jugate, linear, acute, mucronate, 1–1½ lines long, rigidly coriaceous, strongly veined, the midrib nearly central. Flowers 12–20 in copious terminal racemes 1–2 in. long. Pedicels 1–2 lines, erecto-patent, densely bristly. Bracts lanceolate, caducous, ⅛ in. Calyx 2½–3 lines, glabrous, with a pair of small lanceolate bracteoles at the base; lips blunt. Corolla bright orange-yellow, persistent, twice the calyx. Articulations 1–2, hemispherical, ¼ in. long, 2½ lines broad, quite smooth on the faces. Pedicel much shorter than the calyx.

Lower Guinea. Highlands of Huilla, 4500 ft., in sandy thickets, *Dr Welwitsch!*

10. **Æ. glabrescens,** *Welw. mss.* An undershrub 12–18 in. with copiously branched cæspitose ascending angular stems, glabrescent when mature, thinly glandulose-setose when young. Stipules 3–5 lines, lanceolate, rigidly coriaceous. Petioles 1–2 lines; rachis 1½–2½ in., both quite glabrous; leaflets 6–9-jugate, oblong-lanceolate, acute, 6–9 lines long, rigidly coriaceous, strongly veined on both sides. Flowers 10–18 in lax short-stalked terminal racemes reaching 4 in. long. Pedicels 2–4 lines, erecto-patent, usually glabrous. Calyx 2 lines, glabrous; lips oblong, blunt. Corolla orange, more than twice the calyx. Articulations always solitary, 8–9 lines long, 5–6

lines broad, the upper suture nearly straight, the faces flat, quite smooth. Pedicel 4–5 lines.

Lower Guinea. Highlands of Huilla, in sandy pastures, *Dr. Welwitsch!*

11. **Æ. pulchella,** *Planch. in Herb. Kew.* A copiously branched shrub about a foot high with very slender but tough and woody glabrous or slightly viscous bright chestnut-brown terete branches. Stipules ovate-lanceolate, 1½–2 lines deep, firm, persistent, striated. Leaves subsessile, rachis about an inch long; leaflets in 3–6 pairs, oblanceolate, ⅜ in. long, ⅛ in. broad, apex rounded, mucronate, both sides glabrous, coriaceous, under surface with a raised wiry midrib and the finer veins in relief. Upper racemes 6–8-flowered, exceeding the leaves, the lower ones often compound, the rachis and pedicels viscous, the latter spreading at right angles, very slender, ⅛–⅜ in. long. Bracteoles minute, ovate, membranous. Calyx a line deep, cleft nearly to the base. Corolla twice as long as the calyx, bright yellow. Pod sessile, with only a single articulation, ovoid, acuminate, ⅛ in. long, the faces tubercled and slightly reticulated.

Upper Guinea. Senegambia, *Heudelot!*

Very distinct from all the other African species. Near to *Æ. interrupta*, Benth., of Guiana.

12. **Æ. Ruppellii,** *Baker.* A copiously branched low shrub with firm viscid terete chestnut-brown twigs. Stipules minute, lanceolate, deciduous. Leaves on short spreading petioles; rachis an inch or less long; leaflets in 8–12 pairs, linear-oblong, ¼ in. long, 1 line broad, apex rounded, mucronate, texture firm, both sides glabrous. Flowers in elongated 6–8-flowered regular racemes, which are ultimately 1½–2 in. long on as long firm viscid erecto-patent peduncles from the axils of the leaves. Bracteoles ovate, adpressed to the calyx, deciduous. Pedicel as long as the calyx, which is cleft nearly to the base, glabrous, ¼ in. long; the lips entire. Corolla bright yellow, twice as long as the calyx. Pod distinctly stalked, 3–4 lines long, half as broad, with 2 articulations, a very deep constriction between them, the faces flat and naked.—*Ruppellia abyssinica*, A. Rich. Fl. Abyss. i. 203 t. 37.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon! Roth!*

A very closely allied plant from Madagascar (*Æ. laxiflora*, Bojer, mss.), has more slender and quite glabrous stems, persistent ovate cuspidate bracts and fewer flowers in the racemes.

13. **Æ. fulgida,** *Welw. mss.* An erect copiously branched undershrub 2–3 ft. high with bright purplish-brown viscous branches, only the youngest faintly setose. Stipules 2–3 lines, lanceolate, acuminate, caducous. Petioles 1½–2 lines; rachis 8–15 lines, both glabrous; leaflets 20–35-jugate, linear, 1–1½ lines long, blunt, mucronate, subcoriaceous; veins immersed; midrib central. Flowers 3–12 in copious short-stalked axillary racemes 1–3 in. long with a very downy rachis. Pedicels 1–3 lines, articulated at the base, very caducous. Calyx glabrous, ⅜ in. long, clasped on the upper side by an ovate membranous

bracteole half as long as itself; lips entire. Corolla bright orange-yellow, twice the calyx, subpersistent. Articulations 1–2, hemispherical, 2½–4 lines long, smooth on the faces. Pedicel 1½–2 lines.

Lower Guinea. Highlands of Huilla, 5000 ft., *Dr. Welwitsch!*

14. **Æ. bracteosa,** *Welw. mss.* A copiously branched erect undershrub 1½–2 ft. high with slender firm terete branches finely setose only towards the top. Stipules lanceolate, caducous, 1–1½ lines. Petioles 1–1½ lines; rachis 9–15 lines, both viscous; leaflets 15–25-jugate, 1–1½ lines, rigidly coriaceous, oblong-dimidiate, blunt, mucronate, the costa parallel with and contiguous to the upper edge. Flowers in copious elongated terminal and axillary racemes together forming an ample panicle, the end ones reaching 6–8 in. long, the axis flexuose, densely finely glandulose-setose, each node with a pair of lanceolate coriaceous setose-ciliated persistent bracteoles 1 line long. Calyx 2 lines long, glabrous; lips entire. Corolla yellow, twice the calyx, moderately persistent. Articulations 1–2, hemispherical, ¼ in. long, smooth on the faces. Pedicel 1 line long.

Lower Guinea. Highlands of Huilla, 5000 ft., *Dr. Welwitsch!*

15. **Æ. tenuirama,** *Welw. mss.* An erect copiously branched undershrub 2–3 ft. high with very slender rigidly erecto-patent branchlets finely setose in the upper part. Stipules 2–3 lines, linear-lanceolate, caducous. Petiole 1–2 lines; rachis ½–2 in., both bristly; leaflets 20–50-jugate, rigidly coriaceous, blunt, mucronate, 1–2 lines long; midrib subcentral; veins prominent. Flowers 12–20 in copious terminal racemes 2–3 in. long, with a finely bristly axis. Pedicels erecto-patent, 1–2 lines; bracteoles lanceolate, very fugacious. Calyx ⅛ in. long, glabrous; lips entire. Corolla bright yellow, subpersistent, twice the calyx. Articulations 1, rarely 2, hemispherical, upper suture rather recurved, 4 lines long, glabrous on the faces. Pedicel 1½–2 lines.

Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch!*

16. **Æ. debilis,** *Welw. mss.* A copiously branched undershrub 2–3 ft. high with very slender weak trailing branches, clothed in the upper part only with spreading grey pubescence and bristles. Stipules lanceolate, 4–6 lines, coriaceous, persistent. Petioles 1–3 lines; rachis 1½–2 in., leaflets 18–24-jugate, linear, 1½–3 lines long, blunt, mucronate, subcoriaceous, veins immersed, midrib central. Flowers in very lax copious simple or forked axillary and terminal racemes reaching 5–6 in. long. Pedicels 1–3 lines, often curved, with a pair of small lanceolate persistent bracteoles at the base. Calyx 2½ lines, membranous, glabrous, clasped by a pair of lanceolate pubescent bracteoles nearly as long as itself; lips entire. Corolla bright yellow, ½ in. long, subpersistent. Articulations 1–2, hemispherical, ¼ in. long, smooth on the faces. Pedicel ⅛ in. long.

Lower Guinea. Highlands of Huilla, 5000 ft., *Dr. Welwitsch!*

17. **Æ. dimidiata,** *Welw. mss.* A copiously branched ascending undershrub 2–3 ft. high, the woody twigs densely clothed with glands and spreading grey fragile bristles. Stipules membranous, linear, 2–3 lines. Petioles 3–9 lines; rachis 2–4 in., densely setose and viscous; leaflets 25–50-jugate, 3–4 lines long, 1–1½ lines broad, mucronate, rigidly subcoriaceous, very glaucous especially beneath, the costa parallel with and contiguous to the upper edge. Flowers in copious terminal panicles reaching a foot long, the ascending laxly-flowered branches densely setose, the lower ones from the axils of leaves. Pedicels 1–2 lines, erecto-patent. Calyx 4–5 lines, subglabrous, with a single large clasping bracteole at the base; lips blunt oblong. Corolla bright yellow, moderately persistent, half as long again as the calyx. Articulations 1, rarely 2, hemispherical, 7–8 lines long, 5–6 lines broad, quite smooth on the faces. Pedicels 3–4 lines.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

18. **Æ. siifolia,** *Welw. mss.* A rigidly erect sparingly branched undershrub, 3–5 ft. high, the stems glabrescent when mature, furnished when young with copious short spreading bristles. Stipules lanceolate, coriaceous, caducous, 6–12 lines long. Petioles 9–12 lines long; rachis 5–7 in., both finely setose; leaflets 30–35-jugate, oblong, blunt, mucronate, 6–9 lines long, rigidly coriaceous, prominently veined, the midrib central. Flowers in copious terminal panicles reaching a foot long; branches slender, erecto-patent, finely setose, the lower ones compound, subtended by reduced leaves with ovate leaflets 1–1½ lines long. Pedicels 1–2 lines, erecto-patent. Calyx glabrous, 2½ lines, clasped when young by an ovate caducous bracteole 1 line long; lips blunt. Corolla bright yellow, veined with purple, 3–3½ lines. Articulations solitary, hemispherical, 4 lines long, glabrous on the faces. Pedicel 5–6 lines long.

Lower Guinea. Pungo Andongo, 3800 ft., in palm groves, *Dr. Welwitsch!*

A plant collected by Afzelius at Sierra Leone, of which there are several specimens in his own herbarium, labelled by him *Cyclocarpa stellaris*, and one at the British Museum, will no doubt form a new genus near *Æschynomene*, but at present the corolla and calyx are unknown. It is a small erect branched herb under six inches high, with slender naked stems, lanceolate scariose stipules like those of *Smithia sensitiva* with a large linear spur, nearly sessile leaves with 1–3 pairs of oblanceolate glabrous leaflets, 2–4 lines long, 1–1½ lines broad, without stipellæ, flowers solitary or two together on pedicels under a line long from the axils of the leaves, and a flattened circinate glabrous pod about a line broad, with rather more than a single spiral and 8 or 9 subdeltoid articulations not at all indented at the septa.

38. **SMITHIA,** Ait.; Benth. et Hook. f. Gen. Plant. i. 516.

Calyx deeply bilabiate, the upper lip entire or emarginate, the lower three-toothed. Standard suborbicular, shortly unguiculate; wings obliquely oblong or rarely obovate; keel incurved, obtuse or subrostrate. Stamens in a sheath which is slit above and afterwards below; anthers uniform. Ovary sessile or stalked, bi- or multiovulate; style

filiform, incurved; stigma small, terminal. Pod plicate-retracted within the calyx; articulations two or many, finally separating.—Herbs or shrubs.

A small genus, restricted to the Tropics of Asia and Africa.

§ **Eusmithia.**—Stipules with an appendage below the point where they are attached . . . . . 1. *S. sensitiva.*

§§ **Kotschya,** (Endl.).—Stipules not peltate.

Stems herbaceous, annual . . . . . 2. *S. capitulifera.*
Stems woody.
Corolla much exceeding the calyx; racemes few-flowered, distinctly stalked.
Keel $\frac{5}{8}$ in. long, exceeding the standard and wings . . 3. *S. nodulosa.*
Keel $\frac{1}{4}$ in. long, equalling standard and wings . . . . 4. *S. æschynomenoides.*
Corolla scarcely exceeding calyx.
Articulations of pod 7–8 . . . . . 5. *S. Kotschyi.*
Articulations of pod two.
Leaflets 3–4-jugate, $\frac{1}{2}$ in. long . . . . . 6. *S. strobilantha.*
Leaflets 10–12-jugate, under $\frac{1}{4}$ in. long . . . . . 7. *S. strigosa.*

1. **S. sensitiva,** *Aiton; DC. Prod.* ii. 323. Stems herbaceous, 1–2 ft. high, copiously and diffusely branched, the branches firm, slender, glabrous, terete. Stipules ovate-lanceolate, scariose, with a large acuminate spur. Leaves sessile, the rachis about an inch long; leaflets in 6–8 pairs, linear-oblong, 3–4 lines long, 1 line broad, the apex rounded, surfaces glabrous except a row of bristles on the edge and midrib beneath. Flowers in heads of 4–6 on glabrous erecto-patent peduncles an inch long from the axils of the leaves. Pedicels 2 lines long, glabrous. Bracteoles ovate, scarious, adpressed to the calyx. Calyx-lobes persistent, becoming $\frac{3}{8}$–$\frac{1}{2}$ in. long, scarious and marked with fine close longitudinal lines, the upper one entire, the lower sometimes 3-toothed. Corolla yellow, half as long again as the calyx when in flower. Pod included, glabrous, 2–4-jointed, papillose.—A. Rich. Fl. Abyss. i. 203. *S. abyssinica,* Hochst. in Schimp Hb. Abyss. 1838.

Nile Land. Abyssinia, *Schimper! Petit!*
A common East Indian species.

2. **S. capitulifera,** *Welw. mss.* Stem herbaceous, annual, diffuse, reaching a foot high, very much branched, the branches ascending, weak, straw-coloured, finely bristly. Stipules 2 lines deep, persistent, adnate to the petiole, the free points lanceolate. Petiole 2–3 lines long, finely bristly, articulated where it joins the stipule; rachis $\frac{5}{8}$–$\frac{3}{4}$ in. long; leaflets in 8–9 pairs, linear-oblong, 3 lines long, texture rigid, midrib much nearer the upper than the lower edge, veins raised, the rachis bristly and veins beneath slightly so, the edge finely ciliated. Flowers 12–30 in very dense terminal rounded heads subtended by reduced leaves. Pedicels short, ciliated, with two rigid persistent lanceolate ciliated bracteoles at the apex adpressed to the calyx, which is $\frac{1}{8}$ in. deep, four-cleft to the base, the upper lobe ligulate with a prominent keel and deeply cleft at the apex, the three others ovate and

rather shorter, all scarious, ribbed, persistent and ciliated. Corolla yellowish, equalling the calyx. Pod sessile, with two glabrous roundish articulations.

Nile Land. Mininga, *Speke and Grant!*
Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch!*
A very distinct and interesting novelty.

3. **S. nodulosa,** *Baker.* A bush with brittle grey nodose woody branches finely grey-bristly upwards. Stipules $\frac{1}{4}$ in. long, lanceolate, rigid, persistent. Leaves subsessile; rachis pubescent, an inch long; leaflets in 10–12 pairs, 3 lines long, under one line broad, rigid, narrowed to the point, mucronate, nearly glabrous. Flowers in lax corymbs of 3–4 each from the axils of the leaves, on densely grey-pubescent peduncles, which are sometimes an inch long, without bracts or bracteoles. Peduncles spreading, 2–3 lines long, densely pubescent. Calyx glabrous, 4 lines deep, cut down nearly to the base, the upper lobe entire, the lower slightly emarginate. Flowers yellowish, striated, the keel half as long again as the calyx, the standard and wings shorter, the latter 3 lines broad. Young pod longer than the corolla, stalked, with three oblong articulations. Ripe pod not known.

Mozamb. Distr. Zambesi land, Mount Chiradzura, *Dr. Meller!*
Somewhat resembles the Madagascar *S. chamæcrista*, Benth., but that has bristly stems, more numerous leaflets, flowers only 1–2 together on densely bracteated and bristly peduncles and a bristly calyx.

4. **S. æschynomenoides,** *Welw. mss.* An erect undershrub 2 ft. high with numerous slender erecto-patent branches clothed with copious weak spreading glandular bristles. Stipules 1–2 lines, lanceolate, free, membranous, deciduous. Petioles 4–6 lines, glandulose-pubescent; rachis 12–15 lines; leaflets 12–16-jugate, sensitive, oblanceolate, unequal-sided, $\frac{1}{4}$–$\frac{3}{8}$ in. long, 1–$1\frac{1}{2}$ lines broad, not coriaceous, glabrous on both faces, obscurely ciliated, the main vein near the upper edge. Flowers 6–12 in moderately close-stalked racemes equalling the leaves. Bracts and bracteoles similar, minute, ovate. Lower pedicels 2–3 lines. Calyx 2–$2\frac{1}{2}$ lines, membranous, finely pubescent, with five oblong bluntish teeth reaching down nearly to the base. Corolla twice the calyx, yellow veined with purple; standard $\frac{1}{4}$ in. broad. Pod glabrous, not exceeding the calyx; articulations 2, rarely 3.

Lower Guinea. Highlands of Huilla province, Angola, *Dr. Welwitsch!*

5. **S. Kotschyi,** *Benth. Pl. Junghuhn.* 211. An erect shrub with thick rigid woody branches densely clothed with spreading weak yellowish bristles. Stipules ovate-lanceolate, 2–3 lines deep, persistent. Leaves sessile, the rachis $1\frac{1}{2}$–2 in. long, the leaflets in about 20 pairs, linear, the lowest 4 lines long, 1 line broad, upper ones growing smaller gradually, point narrowed, firm, glabrous, rachis a little bristly downwards. Flowers in dense crowded nearly sessile axillary racemes of 6–12 flowers each. Pedicels $\frac{1}{4}$ in. long with a pair of rigid persistent lanceolate bracteoles just below the calyx, which is $\frac{3}{4}$ in. long, scarious

and striated, bristly on the back, the upper lobe entire, the lower deeply three cleft. Corolla about equalling the calyx. Pod with 7–8 roundish articulations, the faces glabrous.—*Kotschya africana*, Endl. Stirp. Mus. Vind. dec. 4; Icon. Gen. Pl. t. 125; Walp. Rep. v. 523.

Nile Land. Nubia, Sennaar, *Kotschy*.

6. **S. strobilantha,** *Welw. mss.* A shrub with firm glabrous or bristly terete woody branches. Stipules elongate lanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, scarious, persistent, not at all adnate. Petiole $\frac{1}{4}$–$\frac{1}{2}$ in. long. Leaflets in 3–4 pairs, arranged subflabellately, $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, one side more rounded than the other, very rigid, both sides glabrous, no distinct midrib but 3 or 4 parallel longitudinal ribs. Flowers in copious dense barrel-shaped heads 6–9 lines long, subsessile in the axils of the leaves. Pedicel $\frac{1}{8}$ in. long, densely bristly, with two semicircular rigid scarious persistent bracteoles at the apex. Calyx 2 lines deep, the lips coriaceous and closely ribbed, the upper one blunt, 2 lines broad, the lower 3-toothed with rounded divisions. Corolla slightly exceeding the calyx. Pod with 1–2 articulations, which are subquadrate, the faces reticulated and bristly.

Lower Guinea. Highlands of Huilla, Angola, *Dr. Welwitsch!*
South Central. Highlands of the Batoka country, *Dr. Kirk!*

7. **S. strigosa,** *Benth. Plant. Junghuhn.* 211. An erect shrub 2–3 ft. high with numerous erecto-patent bristly branches. Stipules 3–4 lines long, adnate to the petiole at the base, the points lanceolate acuminate. Leaves fascicled; petiole $1\frac{1}{2}$–2 lines; rachis 5–6 lines; leaflets 10–12-jugate, ascending, folded together, 2–$2\frac{1}{2}$ lines long, $\frac{1}{2}$ line broad, acute, unequal-sided, strongly-veined, rigidly coriaceous, pale green, bristle-ciliated. Flowers in copious dense sessile axillary heads $\frac{1}{2}$ in. long. Calyx sessile, $\frac{1}{4}$ in. long, densely bristly in the lower part; teeth cuspidate, $\frac{1}{2}$ line broad, reaching down nearly to the base. Bracteoles ovate cuspidate, coriaceous, nearly as long as the calyx. Corolla as long as the calyx; standard and wings violet; keel yellowish. Ovary oblong, biovulate, silky. Pod not seen.

Lower Guinea. Highlands of Huilla, Angola, *Dr. Welwitsch!*
Discovered by Lyall in Madagascar.

The plant published under the name of *S. spicata* (Spreng. Syst. iii. 323, DC. Prod. ii. 323), from Senegambia, according to Dr. Torrey was a compound of the flowers of a *Cassia*, with the fruit of *Mimosa pudica* or *sensitiva*, and was procured by Perrin from a garden in Guadeloupe.

39. GEISSAPIS, Wight et Arn.; Benth. et Hook. f. Gen. Plant. i. 516.

Calyx deeply two-lipped, the upper lip entire, the lower three-toothed. Standard suborbicular, with a short claw; wings obliquely obovate or oblong; keel incurved, obtuse, rather shorter than the standard. Stamens all connate, the sheath slit above, or finally on both sides; anthers uniform. Ovary substipitate, biovulate; style incurved,

subulate or compressed; stigma small, terminal. Upper suture of the pod nearly straight, the lower sinuated, articulations compressed, transversely reticulated, indehiscent.—Herbs remarkable for their large imbricated bracts.

The two other species inhabit the East Indies.

1. **G. lupulina,** *Planch. in Herb. Kew.* Stems a foot or more long, herbaceous, glabrous, copiously branched at the base. Stipules broadly ovate, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, not at all adnate, the point bluntish. Petioles slender, glabrous, about half an inch long; rachis about the same length, the leaflets in 2–3 pairs, and a terminal one, the former short-stalked and with deciduous setaceous stipellæ, both sides glabrous, the lower slightly glaucous. Flowers in dense oblong spikes 1–2 in. long, on slender, erecto-patent peduncles about equalling them. Bracts wrapped round the axils, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{3}{8}$ in. deep, obliquely reniform, much imbricated, not ciliated, membranous, with a network of fine prominent veins, and a single flower in the axil of each. Pedicel glabrous, nearly equalling the glabrous calyx, which is 2 lines deep, cleft nearly to the base. Corolla bright yellow, twice as long as the calyx. Pod equalling the corolla, with two roundish articulations, one sometimes abortive.—Benth. Linn. Trans. xxv. 298. *Sæmmeringia psittacorhyncha,* Webb Spic. Gorgon. 123.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot!*
General habit of the Indian *G. cristata,* in which the bracts are densely ciliated. Also a plant of the Cape Verde islands.

40. **STYLOSANTHES,** Swartz.; Benth. et Hook. f. Gen. Plant. i. 517.

Calyx with an elongated filiform tube and scarious lobes, the four upper ones connate, the lowest distinct. Flowers polygamous, the fertile ones often apetalous (*Welwitsch*). Petals and stamens inserted at the throat of the tube; standard orbicular; wings oblong, free; keel incurved, subrostrate. Stamens all connate in a closed tube; the anthers alternately longer and fixed near the base, and shorter and versatile. Ovary nearly sessile at the base of the tube, 2–3-ovulate. Style long, filiform, after flowering broken at the middle or near the base, the portion that remains becoming decurved; stigma minute, terminal. Pod subsessile, compressed, crowned with the persistent curved base of the style, the articulations usually two, sometimes solitary, rugose-reticulated.—Perennial, often viscous herbs or undershrubs. Leaves pinnately trifoliolate.

A small Tropical genus, principally Brazilian.

§ **Eustylosanthes,** (Vogel).—Fertile flower without any accessory barren one . . . . . 1. *S. viscosa.*

§§ **Stylosma,** (Vogel).—Fertile flower with an accessory rudimentary plumose stalk.
Stems and pod glabrous or nearly so . . . . . 2. *S. erecta.*

Stems finely downy.
Stem erect; rudimentary floret 5–6 lines long . . . . . 3. *S. flavicans.*
Stem diffuse; rudimentary floret 2–3 lines long . . . . . 4. *S. mucronata.*
Stems both downy and bristly . . . . . 5. *S. Bojeri.*

1. **S. viscosa,** *Ser.*; *DC. Prod.* ii. 317. A copiously branched erect shrub, 1–3 ft. high, the branches densely clothed with fine gland-tipped grey hairs. Stipules adnate, $\frac{1}{4}$–$\frac{3}{8}$ in. deep, scarious, viscous on the back like the stem, the points rigid, setaceous. Leaflets narrowly oblong or oblanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. long, 2 lines broad, glabrous or pubescent on both faces. Spike ovate, dense, few-flowered; bracts $\frac{1}{4}$ in. deep, densely bristly on the back and edge. Calyx $\frac{1}{8}$ in. deep, the lobes ciliated. Pod with usually only a single articulation, nearly glabrous, the style very short.—Vogel in Linnæa, xii. 66.

Upper Guinea. Sierra Leone, *Don fide Bentham*, in Fl. Nigr. 301.
A common Tropical American species.

2. **S. erecta,** *Pal. Beauv.*; *DC. Prod.* ii. 317. A copiously branched ascending shrub, sometimes 4–5 ft. high, with the stems glabrous in the lower part but sometimes slightly pubescent upwards. Stipules scarious, glabrous or slightly pubescent, $\frac{3}{8}$–$\frac{1}{2}$ in. deep, adnate to the articulated petiole except the rigid setaceous points. Leaflets oblanceolate, narrowed to both ends, $\frac{1}{2}$–$\frac{3}{4}$ in. long, 2–3 lines broad, rigid, prominently veined, often dotted with black beneath, glabrous or slightly pubescent. Flowers in oblong terminal heads and also in the axils of the upper leaves. Bracts imbricated, hiding the flowers, very rigid and prominently veined, $\frac{3}{8}$ in. deep, emarginate with often a leaflet from the notch, usually but not always glabrous on the back, ciliated. Rudimentary flower equalling the scarious calyx, 2 lines long. Pod $\frac{1}{4}$ in. long, with two articulations, glabrous or finely downy, like the decurved style.—Guill. et Perr. Fl. Seneg. 204. Vogel in Linnæa, xii. 68. *S. guineensis*, Schum. et Thonn. Pl. Guin. 357. Guill. et Perr. Fl. Seneg. 205. *Ononis coriifolia*, Reich. in Sieb. Pl. Seneg. No. 37.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Perrottet!* *Sieber!* and others. Guinea proper, *Beauvois*, *Thonning*, *Vogel!* and others.
Lower Guinea. Congo and Loanda, *Dr. Welwitsch!*

Var. β. *S. acuminata*, Welw. mss.
Leaflets linear-acuminate, 12–15 lines long, casually 5. Petioles, leaves beneath, stipules and bracts on the back furnished with copious black stalked glands.
Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

3. **S. flavicans,** *Baker*. A copiously branched ascending shrub, the branches densely clothed with short yellowish pubescence. Stipules scarious, finely pubescent on the back, $\frac{3}{8}$ in. deep, adnate to the petiole, except the long free falcate, setaceous apices. Leaflets oblanceolate, $\frac{3}{8}$–$\frac{1}{2}$ in. long by 2 lines broad, narrowed to both ends, rigid, and prominently veined, both sides subglabrous. Flowers in dense oblong terminal heads. Bracts densely imbricated, clothed on the back with pubescence like that of the stem, not bristle-ciliated. Calyx 2 lines deep, the very plumose rudimentary floret more than twice as long.

Pod with two articulations, about $\frac{1}{4}$ in. long, both the faces and the style densely silky.

Nile Land. Kordofan, *Kotschy* 425 !

4. **S. mucronata,** *Willd.; DC. Prod.* ii. 318. A copiously branched spreading undershrub with stems not more than a foot long, the branches clothed with short grey pubescence. Stipules scarious, finely bristly on the back, adnate as in the other species. Leaflets $\frac{3}{8}$–$\frac{1}{2}$ in. long, 2 lines broad, narrowed to both ends, the point mucronate, texture very rigid, veins very prominent, under surface finely pubescent. Flowers in dense terminal rounded heads. Bracts rather shorter than in the others, finely pubescent on the back, and sometimes bristle-ciliated. Calyx 2 lines deep, the plumose rudimentary floret slightly longer. Pod with 2 articulations, about $\frac{1}{4}$ in. long, both the faces and style pubescent.—Vogel in Linnæa, xii. 68. *S. setosa*, Harv. et Sond. Fl. Cap. ii. 217.

Upper Guinea. Senegal, *Michelin !*
Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch !*
Mozamb. Distr. Mozambique, *Forbes !* Zambesi land, *Dr. Kirk !*
A common East Indies species, and also a plant of the Cape.

5. **S. Bojeri,** *Vogel in Linnæa*, xii. 68. A copiously branched ascending shrub with the branches clothed both with short pubescence and numerous long spreading yellowish bristles. Stipules scarious, pubescent and bristly on the back, $\frac{3}{8}$–$\frac{1}{2}$ in. deep, adnate to the articulated petiole except the rigid setaceous points. Leaflets oblanceolate, $\frac{3}{4}$–1 in. long, $\frac{1}{4}$–$\frac{3}{8}$ in. broad, narrowed to a point and mucronate, rigid and prominently veined beneath, finely pubescent, and the edge and midrib below ciliated. Flowers in dense oblong terminal heads. Bracts imbricated, densely bristly and pubescent. Calyx 2 lines deep, the rudimentary floret about equalling it. Corolla tube $\frac{1}{4}$ in. long. Pod with two articulations, about a quarter of an inch long, both it and the style finely pubescent.

Mozamb. Distr. Island of Zanzibar, *Bojer ! Dr. Kirk!*
Also a plant of Madagascar. The whole plant, unlike the other species, turns brownish when dried. General habit of the American *S. guianensis*, which has no barren floret.

41. ARACHIS, Linn.; Benth. et Hook. f. Gen. Plant. i. 618.

Calyx-tube filiform, the lobes membranous, the four upper ones connate, the lowest thin, distinct. Petals and stamens inserted into the apex of the tube; standard suborbicular; wings oblong, free; keel incurved, rostrate. Stamens all connate in a closed tube, sometimes nine only; anthers alternately longer and shorter, fixed near the base and versatile. Ovary subsessile at the base of the tube, 2–3-ovulate, the torus after the flower falls becoming an elongated, deflexed, rigid stalk forcing the fruit into the ground, the apex acute, and after the style falls terminated by a stigma-like callus; style long, filiform; stigma minute, terminal. Pod ripening beneath the soil, oblong, reticulated,

indehiscent, subtorulose, but not articulated, continuous within. Seeds 1–3, irregularly ovoid.—Low, often prostrate herbs.

A small genus, the other species confined to Brazil.

1. **A. hypogæa,** *Linn.*; *DC. Prod.* ii. 474. Stems 1–2 ft. long, herbaceous, diffuse, the branches clothed especially above with spreading hairs. Stipules an inch deep, the lower half adnate, the points lanceolate. Petioles 1–1½ in. long, silky. Leaflets in two pairs without a terminal one, obovate, 1–1½ in. long by more than half as broad. Flowers axillary, solitary, on long slender pedicels, only the lower ones fertile. Pod an inch long by half as thick.

Cultivated throughout our bounds as an article of food, as it is everywhere in the Tropics. It is probably a native of Brazil, to which the six other species of the genus belong exclusively. (See De Candolle's "Geographie Botanique," Vol. ii. 964). It is eaten roasted, boiled or converted into an oil.

42. **ZORNIA,** Gmel.; Benth. et Hook. f. Gen. Plant. i. 518.

Calyx membranous, the two upper teeth subconnate, the lowest lanceolate oblong, the two lateral ones much shorter. Standard suborbicular, unguiculate; wings obliquely obovate or oblong; keel incurved, subrostrate. Stamens all connate in a closed tube; anthers alternately longer and shorter, attached near the base and versatile. Ovary sessile, multiovulate; style filiform; stigma small, terminal. Pod compressed, the upper suture nearly straight, the lower deeply sinuated, the articulations indehiscent, smooth or echinate.—Herbs, with equally pinnate, often punctate leaves.

A small genus, one polymorphous species everywhere in the Tropics, the rest mainly American, one also Cape and Angolan.

Leaflets two	1. *Z. diphylla.*
Leaflets four	2. *Z. tetraphylla.*

1. **Z. diphylla,** *Pers. Syn.* ii. 318. Stems a foot or more long, slender, herbaceous, glabrous, diffusely branched from the base. Stipules lanceolate. Petioles ½–¾ in. long, the leaflets in a single pair at the apex, lanceolate, 1–1½ in. long, ¼–⅜ in. broad, the edge slightly ciliated, the surface glabrous. Flowers in lax axillary stalked racemes 2–3 in. long, 6–8 hidden each by a pair of persistent bracts, which are ovate, rigid, ¼–⅜ in. long, slightly bristle-ciliated. Calyx 1½–2 lines long, scarious. Corolla ¼–⅜ in. long, purplish. Pod sometimes exceeding the bracts, articulations 2–4, the bristles ½–1 line long.—Schum. et Thonn. Pl. Guin. 358. Benth. Fl. Nigr. 301. *Z. glochidiata,* Reich. in Sieb. Pl. Seneg. 40. DC. Prod. ii. 316. A. Rich. Fl. Abyss. i. 201. *Z. gracilis,* DC. Prod. l.c. *Z. angustifolia,* Guill. et Perr. Fl. Seneg. 203. Klotzsch in Peters' Mossamb. Bot. 43.

Upper Guinea. Senegambia, *Perrottet! Sieber! Heudelot!* &c. Sierra Leone, *Afzelius!* Guinea proper, *Barter! Vogel! Don!*

Stacked by the Foulahs for horse provender.

Nile Land. Nubia, *Kotschy!* Abyssinia, *Salt! Schimper! Quartin-Dillon.* Unyoro, *Speke and Grant!*

Lower Guinea. Ambaca, Loanda, and highlands of Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Mozambique, *Peters!* Zambesi land, *Dr. Kirk!*

2. **Z. tetraphylla,** *Michx.; DC. Prod.* ii. 317. A diffuse perennial with slender much-branched trailing finely grey-downy stems a foot or more long. Stipules lanceolate. Petioles 4–8 lines long, downy. Leaflets 4, digitate, oblanceolate, 9–12 lines long, 2–3 lines broad, subcoriaceous, subacute, with numerous distinct black dots below. Racemes, bracts, flowers and pod like those of *Z. diphylla.*—Harv. Fl. Cap. ii. 225. *Z. capensis,* Pers. D.C. l.c.

Lower Guinea. Highlands of Huilla, Angola, plentiful at 5500 feet, *Dr. Welwitsch!*

A common Cape species, found also in various parts of North and South America.

43. DESMODIUM, Desv.; Benth. et Hook. f. Gen. Plant. i. 519.

Calyx with a campanulate or obconical tube, the upper two teeth more or less united, the other three acute and deep, often linear-setaceous. Standard obovate or suborbicular; wings adherent to the keel; keel obtuse or rarely a little rostrate, straightish or incurved. Upper stamen connate or free, anthers uniform. Ovary sessile or stipitate, bi- or multiovulate; style inflexed beardless; stigma small, capitate. Pod exserted, sessile or stipitate, compressed, with membranous or coriaceous articulations, flat or rarely subturgid, glabrous or more or less hispid, usually indehiscent at maturity and separating from one another, sometimes dehiscing by the inferior suture.—Herbs or shrubs with pinnately trifoliolate or simple leaves.

A large genus, principally tropical.

A. Group 1. **Eudesmodium.**—*Calyx obconical; keel not appendiculate.*

The only species . . . . . 1. *D. umbellatum.*

B. Calyx campanulate; keel appendiculate.

Group 2. **Chalarium.**—*Both sutures of the pod deeply indented.*

Leaflets three . . . . . 2. *D. spirale.*
Leaflets one . . . . . 3. *D. polygonoides.*

Group 3. **Heteroloma.**—*Upper suture straight; lower deeply indented. Pod sessile.*

Leaves simple.
  Racemes under an inch long . . . . . 4. *D. dimorphum.*
  Racemes several inches long.
    Leaves ovate entire . . . . . 5. *D. gangeticum.*
    Leaves cordate-ovate repand . . . . . 6. *D. lasiocarpum.*
Leaves trifoliolate.
  Racemes very lax; pedicels 4–6 lines long, ultimately patent.
    Shrubby subglabrous . . . . . 7. *D. ascendens.*

Herbaceous, densely pubescent
  Flowers 1–2 together . . . . . 8. *D. delicatulum.*
  Flowers racemose . . . . . 9. *D. hirtum.*
Racemes dense; pedicels 2–3 lines long, erecto-patent.
  Leaflets ovate, 3–4 inches long.
    Stipellæ minute, setaceous . . . . . 10. *D. incanum.*
    Stipellæ large, foliaceous . . . . . 11. *D. sennaarense.*
  Leaflets obovate, under an inch long . . . . . 12. *D. mauritianum.*

Group 4. **Podocarpia.**—*Upper suture straight, lower deeply indented. Pod long-stalked.*

The only species . . . . . 13. *D. Scalpe.*

Group 5. **Nicolsonia.**—*Upper suture straight, lower slightly indented. Flowers in dense racemes.*

Terminal leaflet obovate.
  Articulations of pod 3–4 . . . . . 14. *D. Dregeanum.*
  Articulations of pod 5–7 . . . . . 15. *D. polycarpum.*
Terminal leaflet ovate . . . . . 16. *D. paleaceum.*

Group 6. **Sagotia.**—*Upper suture straight, lower slightly indented. Flowers scattered.*

The only species . . . . . 17. *D. triflorum.*

1. **D. umbellatum,** *DC. Prod.* ii. 325. A shrub 3–6 ft. high with densely grey-silky branches. Petioles an inch long, silky. Leaflets three, the central one obovate, 3–4 in. long, more than half as broad, glabrous and green above, glaucous and glabrescent beneath. Stipellæ minute setaceous. Flowers 6–12 in short stalked umbels from the axils of the leaves. Pedicels 1½–2 lines long, silky. Calyx densely silky, obconical, 2 lines deep. Corolla red, more than twice as long as the calyx. Pod 15–18 lines long, ¼ in. broad, with 3–4 joints, silky, tipped with the persistent style.

Mozamb. Distr. Island of Zanzibar, *Dr. Kirk.*
A native of Madagascar and Tropical Asia.

2. **D. spirale,** *DC. Prod.* ii. 332. Stems annual, 1–2 ft. high, slender, slightly pubescent, and diffuse. Stipules 3–4 lines long, linear, deciduous. Petioles ½–1 in. long; leaflets 3, the terminal one roundish or ovate, 1–2 in. long, ½–1 in. broad, the lateral ones smaller, subpapyraceous, both sides green glabrous. Racemes very lax, terminal and axillary, the former often compound. Bracts minute, setaceous, deciduous. Pedicels 3–4 lines long, spreading, very slender, glabrous. Calyx a line deep, deep-cleft, the teeth setaceous. Corolla slightly exceeding the calyx, greenish, variegated with purple. Pod ⅜–½ in. long, a line broad, with 4–6 articulations separated by very narrow spaces, often spirally twisted, the faces minutely pubescent.—*D. terminale,* Guill. et Perr. Fl. Seneg. 207; DC. Prod. l.c. *D. tortuosum,* Webb, Fl. Nigr. 122. non DC. *D. ospriostreblum,* Steud. in Schimp. Pl. Abyss. No. 1039. *Anarthrosyne abyssinica,* Hochst. in Schimp. Hb. Abyss. No. 1039; A. Rich. Fl. Abyss. i. 204.

Upper Guinea. Sierra Leone, *Smeathmann! Afzelius!* Senegambia, *Leprieur and Perrottet, Heudelot!*

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*
Gathered by Vogel and Dr. Hooker in the Cape Verdes. Common in Tropical America; found also in the East Indies and Polynesian islands.

3. **D. polygonoides,** *Welw. mss.* A herbaceous perennial with densely cæspitose finely grey-downy slender stems not more than half-a-foot high. Stipules linear, $\frac{1}{8}$ in. Petioles 3–4 lines, finely downy. Leaves simple, membranous, cordate, bluntish, 6–10 lines long, glabrous above, faintly pubescent on the ribs below. Flowers in moderately dense stalked terminal racemes $1\frac{1}{2}$–2 in. long. Pedicels $1\frac{1}{2}$–2 lines, finely downy. Bracteoles linear, 1 line. Calyx 1 line, finely downy, the lanceolate teeth exceeding the tube. Corolla pale violet, twice the calyx. Pod with 6–7 articulations, both sutures deeply indented, not seen fully mature.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

4. **D. dimorphum,** *Welw. mss.* An erect undershrub 1–$2\frac{1}{2}$ ft. high, much branched at the base, with firm woody slender angular branches, densely grey-silky upwards. Stipules $\frac{1}{4}$ in. linear, scarious. Petioles slender, 6–8 lines long, much bent at the apex. Leaves simple, oblong, rounded at both ends, often cordate at the base, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long by about half as broad, subcoriaceous, upper surface glabrous, lower thinly grey-silky all over. Racemes under an inch long, crowded, nearly sessile, axillary and terminal, simple. Pedicels 3–4 lines long, slender, nearly glabrous. Bracteoles lanceolate, $1\frac{1}{2}$–2 lines, caducous. Calyx $\frac{1}{8}$ in. deep, very silky, the teeth linear, densely plumose, reaching down nearly to the base. Corolla reddish, about equalling the calyx. Pod 3–4 lines long, sessile, 2–3-seeded, glabrous, the lower suture deeply indented.

Lower Guinea. Golungo Alto, 2400 ft., *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, Manganya country, alt. 3000 ft., *Dr. Kirk!*
Gathered also in Madagascar by Dr. Lyall.

Var. β. *argyreum,* Welw. mss.
Stem simple, erect, densely grey-canescent throughout. Leaves larger, $1\frac{1}{2}$–2 in. long, more densely silky on the underside. Calyx 2 lines long, both tube and teeth very densely clothed with brown silky hairs.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

5. **D. gangeticum,** *DC. Prod.* ii. 327. An erect undershrub 3–5 ft. high, the branches firm but scarcely woody, moderately slender, pubescent upwards. Stipules linear, $\frac{1}{4}$–$\frac{3}{8}$ in. long. Leaves simple, ovate-lanceolate, 3–6 in. long by under half as broad, narrowed gradually to an acute point, edge not at all repand, subcoriaceous, upper surface slightly scabrous, lower paler and thinly adpressed grey-silky. Racemes moderately dense, subsessile, axillary and terminal, the latter compound. Bracts minute, setaceous. Pedicels a line long, slender, erecto-patent. Calyx about the same length, silky, the teeth lanceolate, reaching halfway down. Corolla reddish, twice as long as the calyx. Pod sessile, 6–9 lines long, more than a line broad, the articulations 5–6, the lower suture waved down nearly to the upper one, the faces slightly

hairy.—*Hedysarum gangeticum* and *maculatum*, Linn. Sp. Pl. 1051-2. *H. lanceolatum*, Schum. et Thonn. Pl. Guin. 360.

Upper Guinea. Gold Coast, *Thonning, Burton! Irving!* Princes Island, *Dr. Welwitsch!*
Nile Land. Abyssinia, *Schweinfurth!*
Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Meller!*
A common Indian and Malayan species.

6. **D. lasiocarpum,** *DC. Prod.* ii. 328. An erect undershrub 3–6 ft. high, the branches robust, sulcate, scarcely woody, densely brown-pubescent. Stipules 3–4 lines long, subulate from a much dilated base. Petioles stout, densely pubescent, 4–6 lines long; leaves simple, ovate, 4–5 in. long, 2–3 in. broad, the base much rounded, often cordate, slightly repand, point bluntish, coriaceous, upper surface scabrous, lower glaucous, soft with fine silky pubescence, the veins and veinlets raised. Racemes dense, sessile, narrow, axillary and terminal, the latter compound. Bracts minute, setaceous. Pedicels a line long, slender, erecto-patent. Calyx about the same length, densely silky, the teeth lanceolate, reaching about halfway down. Corolla reddish, twice as long as the calyx. Pod $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad, with 4 or 5 articulations, the lower suture waved quite halfway down, the faces densely hispid.—Guill. et Perr. Fl. Seneg. 207. *D. latifolium*, DC. Prod. l.c. *Hedysarum latifolium*, Roxb. Fl. Ind. iii. 350. *H. deltoides*, Poir. Enc. Suppl. v. 15. *H. deltoideum*, Schum. et Thonn. Pl. Guin. 361. *Anarthrosyne cordata*, Klotzsch in Peters' Mossamb. Bot. 39, t. 7.

Upper Guinea. Sierra Leone, *Smeathmann! Afzelius!* Senegambia, *Leprieur and Perrottet! Heudelot!* Guinea proper, *Vogel! Barter!* and others.
Nile Land. Nubia, *Petherick! Knoblecher.*
Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zanzibar and Mozambique, *Dr. Peters!*
A common Indian and Malayan species.

7. **D. ascendens,** *DC. Prod.* ii. 332. An undershrub 3–4 ft. high with ascending woody branches, thinly pubescent upwards. Stipules lanceolate acuminate, 3–4 lines long. Petiole $\frac{1}{2}$ in. long, firm, subglabrous; leaflets 3, obovate, $\frac{3}{4}$–1 in. long, sometimes nearly as broad as deep, apex rounded, often emarginate, subcoriaceous, upper surface glabrous, lower nearly so or finely adpressed grey-silky. Racemes lax, axillary and terminal, stalked, ultimately half a foot long. Bracts ovate cuspidate, equalling the pedicels, which are very slender 4–6 lines long, spreading ultimately from the rachis at right angles. Calyx $\frac{1}{8}$ in. deep, thinly silky, the teeth linear, reaching down nearly to the base. Corolla reddish, twice as long as the calyx. Pod $\frac{1}{2}$–$\frac{5}{8}$ in. long, a line broad, the joints 3–6, the lower suture waved halfway down, the faces thinly hairy.—*D. racemiferum*, DC. Prod. l.c. *D. oxalidifolium*, G. Don, Gard. Dict. ii. 295; Fl. Nigr. 295.

Upper Guinea. Senegambia, *Heudelot!* Guinea proper, *Vogel!* Fernando Po, *Mann!* St. Thomas, *Don!* Sierra Leone, *Afzelius!*
Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*
A common American species, not known elsewhere in the Old World.

8. **D. delicatulum,** *A. Rich. Fl. Abyss.* i. 205. Stem slender, annual, not more than 6–9 in. high, erect, scarcely branched, clothed upwards with spreading silky hairs. Stipules lanceolate, scarious, 2–3 lines long. Petioles very slender, $\frac{1}{4}$ in. long; lower leaves simple, upper trifoliolate, the leaflets obovate, terminal one 6–8 lines long by about half as broad, apex rounded, emarginate, texture firm, upper surface glabrous, lower slightly silky on the veins. Racemes sessile, terminal, 2–4-flowered. Pedicels very slender, half an inch long. Calyx a line deep, subglabrous, the teeth linear, reaching down nearly to the base. Pod 6–8 lines long, more than one line broad, with 4–6 articulations, the lower suture reaching about a third down, the faces glabrous.

Nile Land. Abyssinia, *Quartin-Dillon and Petit!*
Perhaps a mere variety of *D. hirtum.*

9. **D. hirtum,** *Guill. et Perr. Fl. Seneg.* 209. Stems annual, 2–3 ft. long, copiously and diffusely branched, clothed throughout with spreading silky yellowish-grey hairs. Stipules 3–4 lines long, linear, scariose. Petioles $\frac{1}{2}$–1 in. long, slender, silky; leaflets 3, the terminal one obovate, 1–1$\frac{1}{2}$ in. long, $\frac{5}{8}$–$\frac{3}{4}$ in. broad, lateral ones similar but smaller, upper surface glabrous, lower thinly adpressed grey-silky. Stipellæ minute, setaceous. Flowers in very lax axillary and terminal racemes, the latter sometimes a foot long, the upper flowers solitary, the lower in pairs an inch or more apart, the rachis slender, densely silky. Bracts ovate-acuminate, scarious, deciduous. Pedicels slender, spreading, glabrous, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Calyx very silky, a line deep, cut down nearly to the base, the teeth linear. Corolla red, slightly exceeding the calyx. Pod $\frac{1}{2}$–$\frac{5}{8}$ in. long, a line broad, with 4–6 articulations, the lower suture waved about a third of the way down, the faces thinly hairy.—*Nicolsonia setigera*, E. Meyer, Comm. Pl. Afr. Aust. 124. *Desmodium setigerum*, Benth.; Harv. et Sond. Fl. Cap. ii. 229.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Leprieur and Perrottet!* Guinea, confluence of the branches of the Niger, *Barter!* Princes island, *Dr. Welwitsch!*
Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land and Zanzibar, *Dr. Kirk!*
Also a plant of Natal.

10. **D. incanum,** *DC. Prod.* ii. 332. A diffuse undershrub 2–3 ft. high, the branches finely grey-pubescent upwards. Stipules 3–4 lines long, lanceolate, scarious, at first subconnate. Petiole 1–1$\frac{1}{2}$ in. long, densely clothed with spreading grey hairs; leaflets 3, central one oblong or obovate, 3–4 in. long, generally under half as broad, the edge not at all repand, its petiolule very short and stipellæ minute, setaceous, the lateral leaflets smaller and more rounded at the base, subcoriaceous, upper surface glabrous, lower glaucous thinly and finely pubescent with raised veins. Racemes stalked, moderately lax. Bracts lanceolate, not exceeding the finely silky pedicels, 3–4 lines long. Calyx a line deep, campanulate, subglabrous, the teeth deltoid or lanceolate, reaching halfway down. Corolla 3–4 lines deep, reddish. Pod an inch or more long, $\frac{1}{8}$ in. broad, with 5–8 articulations which

are considerably longer than broad, the faces densely hairy, the lower suture waved three-quarters of the way down.—*D. sparsiflorum*, G. Don, Gard. Dict. ii. 294.

Upper Guinea. Fernando Po and Princes island, *Vogel! Barter! Mann! Dr. Welwitsch!* St. Thomas and Sierra Leone, *Don!*

A common Tropical American species, occurring also in the Mauritius.

11. **D. sennaarense,** *Schweinf. Fl. Æthiop.* 8. An undershrub several feet high, the branches robust, angular, sulcate, densely hispid. Stipules cordate, amplexicaul, persistent, foliaceous. Petiole 2–3 in. long, spreading, hispid; leaflets 3, the central one ovate, 3–4 in. long, by more than half as broad, blunt, the base broadly rounded, its petiolule more than an inch long and stipellæ 3–4 lines long, foliaceous, lanceolate, persistent, the lateral leaflets smaller and more rounded at the base, texture subcoriaceous, upper surface scabrous, lower thinly grey-hairy all over. Racemes stalked, moderately lax. Bracts linear, equalling or shorter than the erecto-patent pedicels, which are $\frac{1}{4}$ in. long. Calyx a line deep, silky, the teeth linear, reaching down nearly to the base. Corolla reddish, scarcely exceeding the calyx. Pod $\frac{3}{4}$–1 in. long, 2 lines broad, the lower suture not waved halfway down; articulations 4–6, the faces hairy.

Nile Land. Sennaar, *Cienkowsky.* Abyssinia, *Schweinfurth!*

12. **D. mauritianum,** *DC. Prod.* ii. 334. An undershrub 3–4 ft. high, with woody ascending slender branches, glabrous or slightly adpressed grey-silky upwards. Stipules linear. Petioles $\frac{3}{8}$–$\frac{1}{2}$ in. long, firm, slender, subglabrous; leaflets 3, obovate, the terminal $\frac{3}{4}$–1 in. long by about half as broad, apex rounded, texture firm, upper surface glabrous, lower glabrous or finely adpressed grey-silky. Racemes mostly terminal, stalked, moderately lax, ultimately often 6 in. long. Pedicels 2–3 lines long, glabrous, slender, erecto-patent. Calyx $\frac{1}{3}$ in. deep, subglabrous, the teeth linear, reaching two-thirds of the way down. Corolla reddish, about twice as long as the calyx. Pod $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad, with 4–5 articulations, the lower suture waved halfway down, the faces densely shortly hispid.—*Hedysarum fruticulosum*, Schum. et Thonn. Pl. Guin. 363. *D. ramosissimum, lineari-folium* and *tenue*, G. Don, Gard. Dict. ii. 294.

Upper Guinea. Sierra Leone, *Afzelius!* St. Thomas, *Don, Vogel! Barter!* Guinea proper, *Thonning, Vogel! Barter! Burton!*

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zanzibar, *Dr. Kirk!*

D. ovalifolium, G. et P. Fl. Seneg. 208, is probably this species, described from a specimen in which the pod was partly abortive, and if so it is also a native of Senegal. It is a plant of Mauritius and Madagascar.

13. **D. Scalpe,** *DC. Prod.* ii. 334. An undershrub, the branches subscandent, slender, angular, finely grey-pubescent upwards. Stipules $\frac{1}{2}$–$\frac{3}{4}$ in. long, lanceolate, scarious. Petioles 3–5 in. long, slender, subglabrous. Leaflets 3, the central one ovate-oblong or obovate, 3–5 in.

long by about $\frac{3}{4}$ as broad, the lower half sometimes subcuneate, the upper slightly repand, its petiolule an inch long, the lateral one smaller and unequal sided, texture membranous, upper surface slightly scabrous, lower finely adpressed-silky on the veins. Racemes long, long-stalked and very lax, principally terminal, often compound below. Lower pedicels often an inch long, the rachis more or less pubescent. Bracts small, linear, deciduous. Calyx 2–3 lines deep, finely hairy, the teeth linear or lanceolate, reaching about halfway down. Corolla reddish, $\frac{3}{8}$–$\frac{1}{2}$ in. deep. Pod distinctly stalked, with 2–4 articulations, which are 3–4 lines long by half as broad, the upper edge straight, the lower suture reaching down nearly to the upper one, the faces naked.—*D. trichocaulon*, DC. Prod. l.c. *Hedysarum repandum*, Poir. Enc. vi. 408 an Vahl? *D. strangulatum*, Wight et Arn. Prod. 228; Harv. Fl. Cap. ii. 229. *D. caffrum*, Eck. et Zey. Hb. 1662. *D. Schimperi*, Hochst. in Schimp. Hb. Abyss. No. 857; A. Rich. Fl. Abyss. i. 205. *D. abyssinicum*, DC. Prod. ii. 338?

Upper Guinea. Cameroon mountains and Fernando Po, *Mann!*
Nile Land. Abyssinia, *Schimper! Roth!*
Lower Guinea. Highlands of Huilla and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Also a plant of Natal, the Mascarene isles, East Indies, and Malaya.

14. **D. Dregeanum,** *Benth.; Harv. Fl. Cap.* ii. 228. An erect undershrub 2–3 ft. high, with branches thinly grey-silky upwards. Stipules small, linear, scarious. Petioles $\frac{1}{4}$ in. long, firm, slender; leaflets 3, obovate, central one half an inch long by about half as broad, apex rounded, subcoriaceous, both sides thinly adpressed grey-silky. Flowers in a short terminal panicle. Bracts ovate, acuminate, scarious. Pedicels equalling the calyx, which is 2 lines deep, densely silky, the teeth linear-setaceous, reaching down nearly to the base. Pod sessile, $\frac{3}{8}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, the lower suture waved a quarter of the way down, articulations 3 or 4, finally glabrous.—*Nicolsonia caffra*, E. Meyer, Comm. Pl. Afr. Austr. 124.

Nile Land. Nubia, *Kotschy, Pl. Æthiop. Exsicc.* 556.
A Cape species, and very near to, perhaps identical with, the East Indian *D. Griffithianum.*

15. **D. polycarpum,** *DC. Prod.* ii. 334. An undershrub procumbent at the base and often rooting at the joints with ascending robust almost woody branches, thinly silky upwards. Stipules ovate cuspidate, scarious, deciduous. Petiole 1 in. or rather more long, erecto-patent, thinly silky; leaflets 3, the terminal one obovate, $1\frac{1}{2}$–2 in. long, by more than half as broad, the apex rounded, retuse or mucronate, the lateral ones smaller and rather narrower in proportion, texture subcoriaceous, upper surface green and glabrous, the lower glaucous, the veins slightly raised. Flowers crowded in dense nearly sessile axillary and terminal racemes. Bracts ovate or lanceolate acuminate, slightly ciliated, deciduous. Pedicels glabrous, a line long, equalling the glabrous campanulate calyx, the teeth reaching halfway down, not

ciliated, lanceolate or deltoid cuspidate. Corolla red, $\frac{1}{4}$ in. deep. Pod $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad, with 5–7 finely hairy articulations about as long as broad.—*H. heterocarpum*, Linn. Sp. Pl. 1054 (form with pod subabortive). *D. heterocarpum*, *angulatum* and *capitatum*, DC. Prod. l.c.

Mozamb. Distr. Island of Zanzibar, *Bojer!*
A common East Indian and Malayan species.

16. **D. paleaceum,** *Guill. et Perr. Fl. Seneg.* 209. Stems 3–4 ft. high, erect, the branches almost woody, moderately stout, terete, thinly adpressed-silky upwards. Stipules ovate acuminate, $\frac{1}{4}$–$\frac{3}{8}$ in. deep, scarious. Petioles $\frac{3}{4}$–$1\frac{1}{2}$ in. long, firm, flattened, glabrous or slightly silky; leaflets 3, ovate-lanceolate, central one 3–5 in. long, $\frac{3}{8}$–$1\frac{1}{2}$ in. broad, narrowed gradually to an acute point, the base round, the edge not at all repand, lateral ones similar, subcoriaceous, upper surface glabrous, lower glaucous, slightly hispid on the veins. Racemes stalked, both axillary and terminal, moderately dense. Bracts 2–3 lines deep, lanceolate acuminate, not ciliated. Pedicels glabrous, 2 lines long, erecto-patent or sub-patent. Calyx thinly silky, a line deep, the teeth linear, reaching more than halfway down. Corolla reddish, more than twice as long as the calyx. Pod sessile, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{8}$ in. broad, the lower suture very slightly indented, articulations 4 or 5, half as long again as broad, the faces thinly clothed with long stiff hairs.—*D. grande*, E. Meyer, Comm. Pl. Afr. Austr. 124; Harv. Fl. Cap. ii. 228. *D. oxybracteum*, DC. Prod. ii. 334? *D. lateristachys* and *juanense*, Bojer, mss.

Upper Guinea. Senegambia, *Leprieur and Perrottet. Heudelot!* Guinea proper, *Vogel!*
Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Also a plant of Madagascar, Natal, and Johanna island.

17. **D. triflorum,** *DC. Prod.* ii. 334. Stems wide-creeping, copiously and diffusely branched, forming a dense matted cluster, the branches slender, glabrous or thinly clothed with fine spreading silky hairs. Stipules lanceolate acuminate, 2 lines deep. Petioles 2–3 lines long, very slender; leaflets 3, broad-obovate, terminal one 4–5 lines long and nearly as broad, lateral ones smaller, both sides glabrous, or nearly so. Flowers 1–3, axillary. Pedicels 4–6 lines long, very slender. Calyx $\frac{1}{8}$ in. deep, silky, the teeth lanceolate acuminate, reaching more than halfway down. Corolla reddish or white, fragrant, about equalling the calyx. Pod 5–8 lines long, $\frac{1}{8}$ in. broad, the lower suture waved one-third of the way down, articulations 4–6, faces subglabrous.—*D. Bullamense*, G. Don, Gard. Dict. ii. 294. *H. granulatum*, Schum. et Thonn. Pl. Guin. 362. *Nicolsonia reptans*, Meissn. in Linnæa, xxi. 260.

Upper Guinea. Guinea proper, *T. Vogel! Barter!*

44. **PSEUDARTHRIA,** Wight et Arn.; Benth. et Hook. f. Gen. Plant. i. 521.

Calyx campanulate, the teeth linear, subequal, the two upper more or less connate. Standard suborbicular, wings free, oblong; keel obtuse. Stamens diadelphous, the upper one free; anthers uniform. Ovary shortly-stalked, multiovulate; style inflexed, subulate; stigma terminal. Pod linear, compressed, inarticulate, continuous within, shortly stalked, usually many-seeded.—Undershrubs, differing from *Desmodium* only in the pod.

Five species are known, one East Indian, and another reaching Natal.

Racemes lax; pod 1–3-seeded . . . . . 1. *P. fagifolia.*
Racemes dense; pod many-seeded.
  Leaves glabrescent beneath . . . . . 2. *P. confertiflora.*
  Leaves densely persistently pubescent beneath.
    Pod 2–2½ lines broad, 5–6-seeded . . . . . 3. *P. macrophylla.*
    Pod ⅛ in. broad, 6–10-seeded . . . . . 4. *P. Hookeri.*

1. **P. fagifolia,** *Baker.* An erect undershrub 3 or 4 ft. high, the branches ascending, firm-herbaceous, sulcate, finely grey-silky upwards. Stipules 3–4 lines long, lanceolate, scarious. Lower petioles 3 in. long, firm, silky; leaflets 3, terminal one oblong-obovate, 3–5 in. long by more than half as broad, repand, base subcuneate, the petiolule more than an inch long, the lateral ones smaller and unequal-sided, subcoriaceous, upper surface slightly scabrous, lower densely adpressed grey-silky all over. Racemes long, narrow, lax, axillary and terminal, the latter compound. Bracts linear, about equalling the erecto-patent pedicels. Calyx ⅛ in. deep, silky, the teeth linear, reaching about halfway down. Corolla reddish, twice as long as the calyx. Pod 3–4 lines long, 2 lines broad, oblong, acuminate, downy, 2–3-seeded, narrowed to a distinct stalk.

Upper Guinea. Sierra Leone, *Afzelius!* Guinea, Yomba, *Barter!*

2. **P. confertiflora,** *Baker.* An erect undershrub 2–3 ft. high, with firm sulcate finely grey-pubescent branches. Stipules lanceolate, scarious, 3–4 lines long. Petioles an inch long, grey-pubescent; leaflets 3, ovate-oblong or obovate, terminal ones 3–4 in. long by about half as broad, slightly repand, lateral ones rather unequal-sided, coriaceous, upper surface green, subscabrous, lower glaucous, silky only on the veins. Flowers in dense axillary and terminal racemes, the latter often compound. Bracts 3 lines long, linear, thinly silky on the back, deciduous. Pedicels ⅛ in. long, about equalling the campanulate calyx, which is slightly silky, with linear subequal teeth reaching halfway down. Corolla twice as long as the calyx. Ovary pubescent, stalked, 5–6-ovulate. Ripe pod not seen.—*Rhynchosia confertiflora,* A. Rich. Fl. Abyss. i. 231. *Anarthrosyne gracilis,* Klotzsch in Peters' Mossamb. Bot. i. 40.

Nile Land. Banks of White Nile, *Knoblecher fide Kotschy.* Abyssinia, *Schimper!*

Mozamb. Distr. Mozambique, *Peters!*
Less woody than *P. Hookeri*, and the unopened racemes not so silky.

3. **P. macrophylla,** *Welw. mss.* An erect undershrub 3–4 ft. high with stout sulcate densely grey-downy branches. Stipules lanceolate, 3–4 lines. Petioles 1–2 in.; leaflets 3, membranous, dull green, scabrous above, pale green and finely persistently grey-downy beneath, the central one obovate, reaching 6–7 in. long, bluntish or subacute, obscurely repand, rounded at the base; side ones smaller, short-stalked, unequal-sided. Flowers in dense terminal panicles reaching down amongst the leaves with crowded racemose branches. Pedicels 1–2 lines, densely grey-downy. Bracts linear, very downy, 2 lines. Calyx $\frac{1}{8}$ in., the lanceolate teeth reaching more than half down. Corolla purplish, twice the calyx. Pod linear, straight, brown, finely downy, 6–8 lines long, 2–$2\frac{1}{2}$ lines broad, 5–6-seeded, not at all torulose, with a pedicel shorter than the calyx.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

4. **P. Hookeri,** *Wight et Arn. Prod. Fl. Ind.* 209. An erect undershrub 3–4 ft. high, with stout sulcate densely grey-downy stems. Stipules lanceolate, 3–4 lines, downy on the back, deciduous. Petioles 6–15 lines, downy; leaflets 3, the terminal obovate, 4–6 in. long, bluntish, obscurely repand, on a petiolule 6–15 lines long, lateral ones much smaller, shortly stalked, texture subcoriaceous, upper surface dull green glabrescent, lower persistently grey-canescent all over. Flowers in copious terminal panicles reaching down amongst the leaves, the branches densely racemose. Pedicels 1–2 lines, densely downy. Bracteoles linear, $1\frac{1}{2}$–2 lines, very downy. Calyx $\frac{1}{8}$ in., very downy, the setaceous teeth reaching more than halfway down. Corolla bright red, more than twice the calyx. Pod linear, brown, finely downy, 8–12 lines long, $\frac{1}{8}$ in. broad, 6–10-seeded, slightly torulose, with a pedicel shorter than the calyx.—*Anarthrosyne robusta*, E. Meyer, Comm. 124; Harv. Fl. Cap. ii. 229. *A. densiflora*, Klotzsch in Peters' Mossamb. Bot. 41.

Nile Land. Abyssinia, *Schimper!* Karaguè, and abundant in Unyoro forests, *Speke and Grant!*
Lower Guinea. Highlands of Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Island of Zanzibar, *Bojer!*
Also a plant of Natal.

45. **URARIA,** Desv.; Benth. et Hook. f. Gen. Plant. i. 521.

Calyx-teeth lanceolate acuminate, spreading, the two upper ones, which by the resupination of the flower become the lowest, the shortest. Standard obovate or orbicular, narrowed into a claw; wings falcate-oblong, adhering to the keel; keel obtuse, slightly incurved. Upper stamen free, the rest connate; anthers uniform. Ovary sessile or short-stalked, bi- or multi-ovulate; style filiform, inflexed upwards; stigma terminal, capitate. Pod subsessile, much constricted between the articu-

lations, which are ovate, subcompressed, withdrawn within the calyx. —Shrubby herbs.

A small genus spread through the Tropics of the Old World.

1. **U. picta,** *Desv.; DC. Prod.* ii. 324. Stems erect, terete, stout but scarcely shrubby, 3–7 ft. high, densely grey-pubescent. Stipules $\frac{1}{2}$–$\frac{3}{4}$ in. long, ovate acuminate, scarious, persistent. Petioles 1–2 in. long, the lower leaves entire, roundish or ovate, the upper ones pinnate, with 2–4 pairs of leaflets, and a terminal one, which are linear, 4–8 in. long, $\frac{1}{4}$–$\frac{1}{2}$ in. broad, stipellate, subcoriaceous, often variegated, upper surface subscabrous, lower finely pubescent with the veins and veinlets pale and raised. Flowers in dense terminal racemes sometimes more than a foot long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad. Bracts ovate, acuminate, scarious, ciliated, equalling the hispid pedicel, which turns completely round after flowering. Calyx $\frac{1}{4}$ in. deep, cleft nearly to the base, densely hispid. Corolla purple, half as long again as the calyx. Pod 3–6-jointed, the seeds soon glabrous, bright-polished, greyish-white.—*Hedysarum pictum*, Jacq. Ic. Rar. iii. t. 567. Schum. et Thonn. Pl. Guin. 364.

Upper Guinea. Guinea proper, *Thonning, Vogel! Barter! Irving!* Sierra Leone, *Afzelius!*

Nile Land. Madi, *Speke and Grant!* Banks of White Nile, *Schweinfurth.*

Lower Guinea. Ambaca and highlands of Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

A common East Indian species, extending to North Australia.

46. **ALYSICARPUS,** Neck.; Benth. et Hook. f. Gen. Plant. i. 522.

Calyx deeply cleft, the lobes rigid, glumaceous, the three lower ones subequal, the two upper ones connate. Standard orbicular or obovate, narrowed into a claw; wings obliquely oblong, adherent to the keel; keel slightly incurved, obtuse. Upper stamen free, the rest connate. Ovary sessile or short-stalked, multiovulate; style filiform, incurved at the apex, with a broadly capitate stigma. Pod subterete, equal or constricted between the articulations, which are roundish or truncate at the ends and indehiscent.—Diffuse herbs with the leaves simple in all our species.

A small genus, diffused widely through the Tropics of the Old World.

Calyx not exceeding the first joint of the pod.
- Joints deeply constricted . . . . . 1. *A. monilifer.*
- Joints scarcely constricted . . . . . 2. *A. vaginalis.*

Calyx equalling at least two or three joints of the pod.
- Articulations scarcely wrinkled on the face.
  - Largest leaves 15–18 lines long . . . . . 3. *A. ferrugineus.*
  - Largest leaves 6–7 lines long . . . . . 4. *A. Zeyheri.*
- Articulations much wrinkled on the face.
  - Calyx-lobes linear, not imbricated . . . . . 5. *A. porrectus.*
  - Calyx-lobes lanceolate, imbricated . . . . . 6. *A. rugosus.*

1. **A. monilifer,** *DC. Prod.* ii. 353. Stem annual or biennial, diffusely branched, tough, slender, slightly silky. Stipules lanceolate, pale, scarious, striated, about equalling the petioles, which are 2–3 lines

long. Leaves cordate-ovate, or oblong or lanceolate, 1–2 in. long, firm, both sides pale green and prominently veined, glabrous or nearly so. Racemes axillary and terminal, stalked, laxly 4–6-flowered. Pedicel 1–1½ lines long. Calyx a line deep, subglabrous, cleft nearly to the base, the teeth linear. Pod ½–⅝ in. long, ⅛ in. thick, articulations 3–4, oblong with deep constrictions between them, glabrous, and very slightly wrinkled.—*A. vaginalis*, Hochst. in Kotsch. Pl. Nub. 27, and Schimp. Hb. Abyss. 2251, non DC.

Nile Land. Kordofan, *Kotschy*, 27 ! Abyssinia, *Schimper !*

A common East Indian species.

2. **A. vaginalis,** *DC. Prod.* ii. 353. Stems annual or biennial, copiously and diffusely branched, sometimes 3 or 4 ft. long, tough, slender, glabrous or finely hairy. Stipules lanceolate, pale, striated, generally exceeding the petioles, which are 2 or 3 lines long. Leaves cordate-ovate or oblong or lanceolate, 1–2 in. long, texture firm, both sides pale green and prominently veined, glabrous or nearly so. Racemes axillary and terminal, rather denser and more numerously flowered than in the preceding. Pedicel a line long. Calyx obconical, slightly hairy, 2 lines deep, scarious, striated, the teeth lanceolate, reaching more than halfway down. Pod sessile, ½–¾ in. long, more than a line thick, 4–6-jointed, scarcely at all constricted, the articulations rather longer than broad, deeply wrinkled, slightly pubescent.—Guill. et Perr. Fl. Seneg. 210. *A. nummularifolius*, DC. Prod. l.c. *Hedysarum bupleurifolium*, Reich. in Sieb. Pl. Seneg. No. 39, non Linn. *A. Harnieri*, Schweinf. Rel. Kots. 24, t. 19.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Sieber ! Heudelot!* Guinea proper, *Vogel! Barter !*

Nile Land. Nubia, *Kotschy! Petherick!*

Lower Guinea. Congo, Loando, and highlands of Ambaca, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

A common weed in the Tropics of the Old World, and introduced into America.

3. **A. ferrugineus,** *Hochst. et Steud. in Schimp. Hb. Abyss.* No. 306. An undershrub 2–3 ft. high, with firm ascending branches, clothed upwards with fine silky spreading brown hairs. Stipules lanceolate, ⅜ in. deep, much exceeding the very short petioles. Leaves cordate-oblong, the largest 1½ in. long by 1 in. broad, apex rounded, mucronate, subcoriaceous, both sides pale green and prominently veined, glabrous or nearly so. Racemes stalked, terminal, the upper part or the whole dense, sometimes 6–9 in. long. Pedicels silky, 1½–2 lines long. Bracts obovate cuspidate, equalling the calyces, which are ⅜ in. deep and like them clothed, especially along the edge, with ferruginous silky hairs, the teeth imbricated, reaching down nearly to the base. Pod equalling or exceeding the calyx, 1 line thick, deeply constricted, articulations 3–4, subglobose, not wrinkled.—A. Rich. Fl. Abyss. i. 207.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit! Plowden!*

4. **A. Zeyheri,** *Harv. Fl. Cap.* ii. 230. A copiously branched ascending perennial, not more than a foot high, with obscurely grey-

downy branches. Stipules lanceolate, 2–3 lines, exceeding petioles. Leaves cordate-oblong or roundish, reaching 6–7 lines long, bluntish with a mucro, subcoriaceous, pale green, prominently veined on both sides, subglabrous. Racemes terminal, lax, usually stalked, reaching 6–9 lines long. Pedicels 1–1½ lines, erecto-patent, finely grey-downy. Bracts ¼ in. long, lanceolate cuspidate, closely ciliated with pale brown silky hairs. Calyx ½ in. long, teeth reaching down nearly to the base, imbricated, ciliated like the bracts. Pod 4–5 lines, obscurely downy, usually exserted; articulations 3–4, deeply constricted, scarcely wrinkled.

Lower Guinea. Highlands of Huilla, 5500 ft., *Dr. Welwitsch!*

5. **A. porrectus,** *Welw. mss.* A copiously branched annual 1–2 ft. high with obscurely grey-downy branches. Stipules lanceolate, 3–4 lines, exceeding the petioles. Leaves oblong-lanceolate, 15–21 lines long, bluntish with a mucro, subcoriaceous, nearly glabrous. Racemes lax, usually terminal, short-stalked, 4–6 in. long. Bracts lanceolate, 2–2½ lines, obscurely ciliated. Calyx 2½–3 lines, teeth linear, ½ line broad, not imbricated. Pod twice the calyx; articulations 5–6, deeply constricted, much wrinkled on the faces.

Lower Guinea. Loanda, *Dr. Welwitsch!*
General habit just that of *A. vaginalis* and *rugosus*.

6. **A. rugosus,** *DC. Prod.* ii. 353. A copiously branched diffuse annual or biennial herb reaching 3–4 ft. high, with tough subglabrous stems. Stipules linear, 3–4 lines, equalling or exceeding petioles. Leaves varying from linear to oblong, acute or blunt, 1–3 in. long, subcoriaceous, glabrous. Racemes moderately dense, usually terminal, stalked, 2–4 in. long. Pedicels erecto-patent, 1½–2 lines. Bracts ovate-lanceolate, 2½–3 lines. Calyx ¼ in., teeth lanceolate, glabrous, reaching down nearly to the base, 1 line broad, imbricated even in the latest stage. Pod seldom exserted, 1 line broad; articulations 3–5, much wrinkled on the faces.—*Hedysarum rugosum* and *ovalifolium*, Schum. et Thonn. Pl. Guin. 358. *A. Wallichii*, Wight et Arn. Prod. 234; Harv. Fl. Cap. ii. 230. *A. glaber*, E. Meyer. Comm. 125. *A. Hochstetteri*, A. Rich. Fl. Abyss. i. 209.

Upper Guinea. Senegal, *Leprieur! Perrottet!* Niger country, *Thonning, Barter!*

Nile Land. Nubia, *Kotschy! Petherick!* and others. Abyssinia, *Schimper!* and others.

Lower Guinea. Ambaca and highlands of Pungo Andongo, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi-land, *Dr. Meller! Dr. Kirk!*

Var. β. *A. styracifolius*, DC. Prod. ii. 353.
Branches slightly pubescent. Bracts and calyx-lobes slightly grey-downy on the back and edge.

Nile Land. Callabat, *Schweinfurth!*

Var. γ. *A. Quartinianus*, A. Rich. Fl. Abyss. i. 208.
More robust, with broader stipules. Upper part of the stem and bracts, especially along the margin, clothed with fine brown silky pubescence.

Nile Land. Abyssinia, *Quartin-Dillon!* Karaguè, *Speke and Grant!*
Extends to the Cape and through Tropical Asia to Australia, and is naturalized in the West Indies.

47. **CICER,** Linn.; Benth. et Hook. f. Gen. Plant. i. 524.

Calyx-tube oblique, the teeth long, subequal. Standard ovate or suborbicular, narrowed into a broad claw; wings obliquely obovate, free; keel broadish, incurved, obtuse or subacute. Upper stamen free; anthers uniform. Ovary sessile, bi- or multiovulate; style filiform, inflexed, beardless; stigma terminal. Pod sessile, oblong, turgid, 2-valved.—Viscous annual herbs with the petiole ending in a tendril.

A small genus belonging principally to Western Asia.

1. **C. arietinum,** *Linn.; DC. Prod.* ii. 354. Stems annual, 12–18 in. high, pubescent. Stipules flabellately cut nearly to the base. Leaflets 12–16, oblanceolate-cuneate, deeply inciso-dentate, subcoriaceous, viscous and prominently veined. Peduncles solitary, axillary, 6–10 lines long, geniculate and bracteolate. Calyx $\frac{1}{4}$–$\frac{3}{8}$ in. deep, cut down nearly to the base, viscous, the teeth linear. Corolla purplish, the roundish standard exceeding and the wings about equalling the calyx. Pod oblong, 8–9 lines long, about half as broad, finely silky.—*C. cuneatum,* Hochst. in Schimp. Hb. Abyss. No. 810; A. Rich. Fl. Abyss. i. 195.

Nile Land. Abyssinia, *Schimper!*

Our description is taken entirely from the wild Abyssinian specimens labelled *C. cuneatum* by Hochstetter, which do not appear to differ in any important particular from the cultivated *C. arietinum,* which is grown extensively in Abyssinia and Angola, and is represented by Schimper's No. 47! The local name is *Chimbera.*

48. **VICIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 524.

Calyx-tube oblique, the teeth subequal. Standard obovate, narrowed into a broad claw; keel shorter than the wings. Stamens usually diadelphous, the sheath with a very oblique mouth. Ovary subsessile or stipitate, bi- or multiovulate; style inflexed, filiform or slightly flattened, bearded at the apex or pubescent throughout. Pod compressed, 2-valved, 2- or many-seeded.—Herbs with equally pinnate leaves ending in twining tendrils.

A large genus, spread over the temperate regions of both hemispheres.

Pod glabrous, 6–9-seeded.
- Flowers middle-sized, solitary, sessile . . . . . 1. *V. sativa.*
- Flowers small, 1–3, pedunculate . . . . . 2. *V. paucifolia.*

Pod hairy, 2-seeded . . . . . 3. *V. hirsuta.*

1. **V. sativa,** *var. abyssinica, Baker.* A slender glabrous annual 6–9 in. high. Stipules semi-sagittate, deeply toothed. Leaflets in 3–4 pairs, linear-oblong, 6–8 lines long, retuse and mucronate. Flowers solitary, nearly sessile. Calyx glabrous, $2\frac{1}{2}$–3 lines long, the teeth linear. Corolla pale, half as long again as the calyx. Pod linear, 15-18 lines long, 4 lines broad, slightly upcurved, 6–8-seeded.—*V. abyssinica,* Alefeld in Bonpl. 1861, 72.

Nile Land. Abyssinia, *Schimper!*
Agrees with the European var. *Bobartii* in habit, differing only in the small pale corolla. The typical *V. sativa* is much cultivated in Abyssinia, under the name of *Ententeratt*.
V. Faba, L., the common bean, is cultivated in Abyssinia under the name of *Aterbari*.

2. **V. paucifolia,** *Baker*. An erect glabrous annual about a foot high, with slender acutely tetragonous stems. Stipules 3–4 lines long, both blade and spur linear. Leaves subsessile, with two pairs of linear leaflets 12–18 lines long, 1–1½ lines broad, and a simple twining tendril. Flowers 1–3 on a peduncle 9–12 lines long, secund. Pedicels 1½–2 lines long, glabrous. Calyx 2 lines deep, glabrous, the linear-setaceous teeth reaching halfway down. Corolla ¼ in. deep, pale lilac. Pod linear, an inch long, ¼ in. broad, shortly stipitate, glabrous, 6–9-seeded.

Nile Land. Abyssinia, *Schimper!*
Closely allied to the South American *V. graminea*, Smith (*V. bidentata*), Hook.

3. **V. hirsuta,** *Koch Syn.* 191. Stems annual, slender, trailing, pubescent. Stipules linear-lanceolate, with one or more setaceous teeth. Leaflets in 8–10 pairs, linear. Flowers 3–6 in a stalked dense raceme. Calyx ⅛ in. deep, the teeth linear. Style slightly compressed. Pod 4 lines long by half as broad, hairy, 2-seeded.—*Ervum hirsutum*, Linn. Sp. 1039. A. Rich. Fl. Abyss. i. 197.

Nile Land. Abyssinia, *Schimper!*
E. Lens is cultivated in Abyssinia under the name of *Messer* and *Bersem*, and also in Nubia.

49. **LATHYRUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 526.

Calyx-tube oblique, the upper teeth shorter. Standard orbicular, shortly unguiculate; keel incurved, obtuse. Stamens monadelphous or diadelphous, the mouth of the sheath not oblique. Ovary sessile (rarely stipitate) multiovulate; style inflexed, flattened vertically upwards, bearded on the inner face. Pod compressed or subterete, two-valved, continuous within, many-seeded.—Herbs with the petiole in all our species extending into a clasping tendril.

A large genus, with a geographical range like that of *Vicia*.

Perennial; stems not winged; flowers in racemes . . . . . 1. *L. pratensis.*
An erect annual, with wingless stems . . . . . 2. *L. sphæricus.*
Diffuse annuals, with winged stems.
  Pod oblong, narrowly winged down each side of the upper suture 3. *L. sativus.*
  Pod linear, not winged . . . . . 4. *L. annuus.*

1. **L. pratensis,** *L.; DC. Prod.* ii. 370. A diffuse perennial, the stems slender, wingless. Leaves with a single pair of lanceolate leaflets. Flowers middle-sized, bright yellow, 4–12 together in long-stalked axillary racemes. Pod linear, an inch or more long, 3 lines thick, finally black.—A. Rich. Fl. Abyss. i. 199.

Nile Land. Abyssinia, *Petit!*
Ranges throughout Europe to the north-west of India.

2. **L. sphæricus,** *Retz.; DC. Prod.* ii. 372. A glabrous suberect annual with slender wingless stems. Leaves with a single pair of linear leaflets, the tendril a mere bristle in the lower ones. Flowers solitary on short axillary peduncles. Calyx under 3 lines long, the teeth lanceolate. Corolla reddish, the standard twice the calyx. Pod linear, 1½–2 in. long, 2–3 lines thick, glabrous, not winged.—A. Rich. Fl. Abyss. i. 199.

Nile Land. Abyssinia, *Quartin-Dillon and Petit!*
Common round the Mediterranean, and extending to the north-west of India.

3. **L. sativus,** *Linn.; DC. Prod.* ii. 373. A slender diffuse glabrous annual with stems narrowly winged upwards. Leaves with a single pair of lanceolate leaflets, 12–18 lines long, ⅜–½ in. broad. Flowers solitary on axillary peduncles. Calyx ¼ in. deep, the teeth lanceolate. Flowers reddish-purple or white, the standard 8–9 lines broad. Pod oblong, 12–18 lines long, 5–6 lines broad, glabrous, 3–4-seeded, narrowly winged down each side of the upper suture.—A. Rich. Fl. Abyss. i. 198.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit.*
Lower Guinea. Angola, *Dr. Welwitsch.*
Cultivated under the names of *Sobbeure*, *Ater*, and *Schimbera*.

4. **L. annuus,** *Linn.; DC. Prod.* ii. 373. A slender diffuse glabrous annual with stems narrowly winged upwards. Leaves with a single pair of linear or linear-lanceolate leaflets. Flowers 1–3 together on elongated axillary peduncles. Calyx glabrous, ¼ in. long, the teeth lanceolate-acuminate. Corolla yellow, more than twice the calyx. Pod linear, 2–2½ in. long, 5–6 lines broad, channelled down the upper suture but not winged, 6–9-seeded.

Nile Land. Abyssinia (*teste Schweinfurth!*)
Pisum sativum and *arvense* are both cultivated in Abyssinia, and we have examples of the former from Angola, and brought from an elevation of 4–5000 ft. at Karaguè by Speke and Grant. *P. abyssinicum*, described by Dr. A. Braun, in the Flora for 1841, p. 269, also cultivated in Abyssinia, does not appear to differ from the latter materially.

50. **ABRUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 527.

Calyx truncate or the teeth very short. Standard ovate, narrowed into a broad short claw, more or less adherent to the staminal tube; wings narrowly falcate-oblong; keel longer and broader than the wings, arcuate. Stamens nine, connate in a sheath slit above, the tenth absent; anthers uniform. Ovary subsessile, multiovulate; style short, incurved, beardless; stigma capitate. Pod oblong or linear, plano-compressed, two-valved, subseptate between the seeds.—Shrubs with elongated climbing branches.

A small genus, widely dispersed through the tropics.

Branches and leaves below glabrous.
- Pod half to a third as broad as long, 4–5-seeded . . . . . 1. *A. precatorius.*
- Pod four or five times as long as broad, 7–9-seeded.
  - Leaflets 10–20 . . . . . 2. *A. pulchellus.*
  - Leaflets 25–30 . . . . . 3. *A. Schimperi.*

Branches and leaves below persistently downy . . . . . 4. *A. canescens.*

1. **A. precatorius,** *Linn.*; *DC. Prod.* ii. 381. A shrub with slender woody wide-climbing branches. Stipules setaceous, deciduous. Leaves short-stalked; rachis 2–3 in. long; leaflets subsessile, deciduous, in 10–15 pairs, oblong or obovate, blunt, $\frac{1}{2}$–$\frac{5}{8}$ in. long, glabrous, or the lower side slightly silky. Racemes axillary and terminal, dense, stalked, 2–3 in. long. Pedicels shorter than the campanulate calyx, which is thinly silky, the teeth very short, subdeltoid. Corolla $\frac{3}{8}$ in. deep, reddish. Pod 1–$1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. broad, oblong, rostrate, subcoriaceous, papillose, glabrous when mature. Seeds 4–5.—Guill. et Perr. Fl. Seneg. 212. Harv. Fl. Cap. ii. 263.

Upper Guinea. Senegambia, *Perrottet.* Sierra Leone, *Dr. Kirk! Dr. Welwitsch!* Fernando Po, *Mann!* Guinea proper, *Mann!*
Lower Guinea. Loanda and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Widely distributed through the tropics, but often planted.

2. **A. pulchellus,** *Wall.*, *Thw. Enum. Pl. Zeyl.* 91. A shrub with slender wide-climbing woody branches sometimes 20 ft. long. Stipules small, rigid, deciduous. Leaves nearly sessile; rachis 2–3 in. long; leaflets in 5–10 pairs, oblong or obovate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long, both ends rounded, glabrous or finely silky. Racemes 2–3 in. long, lax, leafy below. Calyx a line long, glabrous or thinly silky, subtruncate, equalling the pedicel. Corolla pale purple, half an inch deep. Pod 2 in. long, $\frac{1}{2}$ in. broad, linear, slightly recurved, the valves membranous, not papillose, finely silky when young. Seeds 7–9.—*A. acutifolius*, Blume. *A. melanosperma*, Hassk. *A. lævigatus*, E. Meyer, Comm. 263. Harv. Fl. Cap. 263.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius!* Onitsha and Jeba, on the Quorra, *Barter!*
An East Indian and Malayan species, and extending southward to Natal and Kaffraria.

3. **A. Schimperi,** *Hochst. in Schimp. Hb. Abyss.* No. 1552. A shrub with slender woody branches, slightly silky upwards. Stipules small, setaceous, deciduous. Leaves short-stalked; rachis 4–6 in. long; leaflets in 12–15 pairs, oblong or obovate, $\frac{3}{4}$–1 in. long, blunt, mucronate, both sides glabrous. Racemes lax, 3–4 in. long, extending in our specimens down amongst the leaves. Pedicel a line long, densely tawny-silky. Calyx $\frac{1}{8}$ in. deep, truncate, thinly brown-silky. Corolla $\frac{1}{2}$ in. deep, reddish. Pod 2–$2\frac{1}{2}$ in. long, $\frac{3}{8}$ in. broad, 7–9-seeded, the valves thinner than in *A. precatorius*, glabrous, slightly papillose. Seeds oblong, dark brown.

Nile Land. Abyssinia, *Schimper!* Madi, *Speke and Grant!* Nubia, Ronga, *Binder* (*fide Kotschy*).

4. **A. canescens,** *Welw. mss.* A wide-climbing shrub with densely finely grey-downy branches. Stipules deciduous. Leaves subsessile; rachis $2\frac{1}{2}$–3 in. long; leaflets 12–14, oblong-lanceolate, $\frac{1}{2}$–$\frac{5}{8}$ in. long, subcordate at the base, blunt with a distinct mucro, inconspicuously downy above, grey-green and more pubescent beneath. Racemes ter-

minal, $\frac{1}{2}$–$2\frac{1}{2}$ in. long, on longer downy peduncles, the flowers in 2–5 often distinctly separated fascicles. Bracts linear-lanceolate, $\frac{1}{4}$ in., and linear bracteoles persistent. Calyx $\frac{1}{8}$ in., grey-canescent; teeth short, deltoid. Corolla purple, $\frac{1}{2}$ in. Pod 21–24 lines long, nearly $\frac{1}{2}$ in. broad, finely pubescent, straight, 8–9-seeded.

Lower Guinea. *Pungo Andongo, Dr. Welwitsch!*

A plant gathered by Dr. Welwitsch in Cazengo at 2000 ft. above sea-level is probably a new closely-allied species, but the specimens are not complete enough to describe fully. It is as downy as this, but the leaflets are rather fewer, the racemes all axillary, and pods much shorter (15–18 lines).

51. **CENTROSEMA,** DC.; Benth. et Hook. f. Gen. Plant. i. 527.

Calyx shortly campanulate, the teeth subequal or the two upper ones connate. Standard orbicular; wings falcate-obovate; keel broad, incurved. Upper stamen free or more or less connate with the others; anthers uniform. Ovary subsessile, multiovulate; style incurved, more or less dilated at the apex, slightly bearded round a terminal stigma. Pod subsessile, linear, subcompressed, two-valved, subseptate between the seeds internally, the sutures incrassated, the valves on both sides traversed by a prominent nerve near the edge or winged near the lower suture.—Climbing herbs or undershrubs.

A small genus, confined to America, except for the occurrence of this species in our bounds.

1. **C. virginiana,** *Benth. in Ann. Mus. Vind.* ii. 120. Stems slender, firm-herbaceous, wide-climbing, glabrous or slightly pubescent. Petioles 1 in. long; leaflets three, ovate, $1\frac{1}{2}$–2 in. long, $\frac{3}{4}$–1 in. broad, prominently veined, firm, glabrous or slightly hairy. Peduncles axillary, 1–4-flowered, exceeding the petioles. Pedicels $\frac{1}{4}$ in. long, with a pair of ovate acuminate striated bracteoles at the apex, which nearly equal the calyx, which is $\frac{3}{8}$–$\frac{1}{2}$ in. deep, the upper teeth linear, reaching halfway down, the lowest longer. Corolla an inch deep, violet-purple, the standard an inch broad. Pod 3–4 in. long, $1\frac{1}{2}$–2 lines broad, glabrous, nearly straight, 12–18-seeded.—*C. decumbens*, Mart., Benth. l. c. *Clitoria virginiana*, Linn. Sp. Pl. 753. DC. Prod. ii. 234.

Upper Guinea. Cape Coast, *Vogel!*

A common Tropical American species, extending north to Maryland.

52. **CLITORIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 528.

Calyx tubular with deep teeth and two large persistent bracteoles. Corolla large, the ample standard much exceeding the wings and incurved acute keel. Stamens diadelphous; anthers uniform. Ovary stipitate, linear, multiovulate; style flattened, bearded along the inner face. Pod stalked, linear, compressed, dehiscent, many-seeded, the faces in our plant plain.—Twining or suberect herbs or shrubs with pinnately tri- or multi-foliolate leaves.

A small genus, widely spread through the tropics.

1. **C. Ternatea,** *L.; DC. Prod.* ii. 223. Wide-climbing with rather shrubby slender slightly pubescent stems. Leaves imparipinnate with 5–7 subcoriaceous stipellate oblong leaflets 1–2 in. long. Flowers solitary on short pedicels in the axils of the leaves. Bracteoles round, 3–6 lines long. Calyx 6–9 lines long, the oblong-lanceolate teeth half the tube. Corolla 15–18 lines long, the standard bright blue or white with an orange throat an inch or more broad. Pod linear, 3–4 in. long, 8–10-seeded.—Bot. Mag. t. 1542. *Ternatea vulgaris,* H.B.K. Nov. Gen. vi. 415.

Upper Guinea. Senegal, *Heudelot! Perrottet!* Sierra Leone, *Barter! Dr. Daniell!* Niger land, *Barter!*
North Central. Mandra, *E. Vogel!*
Nile Land. Nubia, Sennaar, and Kordofan, *Cienkowski, Von Harnier,* &c. Abyssinia, *Salt! Schimper!*
Lower Guinea. Loanda, in dry sandy ground, climbing over Euphorbias, and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Kirk!*
Everywhere in the tropics, and very common in cultivation.

53. **SHUTERIA,** Wight et Arn.; Benth. et Hook. f. Gen. Plant. i. 529.

Calyx-teeth short, the two upper ones connate. Standard obovate, suberect, narrowed into a claw, inappendiculate; wings narrow, oblique, adherent to the keel; keel shorter than the wings, nearly straight, obtuse. Upper stamen free, the others connate; anthers uniform. Ovary subsessile, or shortly stipitate. Style incurved, filiform, beardless; stigma capitate, terminal. Pod linear, subobtuse, two-valved, obscurely septate between the seeds.—Twining herbs.

A small genus, the other species all East Indian.

1. **S. africana,** *Hook. f. in Journ. Linn. Soc.* vii. 190. Stems firm, slender, wide-climbing, 10–12 ft. long, densely clothed with decurved brown silky hairs. Stipules lanceolate, scarious, striated, persistent, 3–4 lines long. Petioles densely brown-silky, 1½–2 in. long; leaflets three, stipellate, ovate-oblong, the terminal one 1½–2 in. long, 1–1¼ in. broad, the apex rounded and mucronate; petiolule ¼ in. long; lateral leaflets unequal-sided, papyraceous, upper surface green, thinly silky, lower grey and more silky, the main veins raised and subferruginous. Flowers 6–8 in lax long-stalked racemes equalling the leaves. Bracts lanceolate, scarious, persistent. Pedicel 1 line long, silky. Calyx obconic, 2½ lines deep, thinly silky, the upper tooth deltoid acuminate, the others lanceolate or linear reaching a third down. Corolla purplish, twice the calyx. Pod stipitate, an inch long, ¼ in. broad, narrowed at the base, firm, finely silky, 3–4-seeded.

Upper Guinea. Cameroon mountains, at 7000 feet, *Mann!*
Nile Land. Abyssinia, *Dr. Roth!*

We have what is probably a second undescribed species from Dr. Kirk, from Zanzibar, but it is in pod only. It is quite as wide-climbing as and rather more robust

than *S. africana*, only the very youngest stems slightly adpressed grey-silky, the leaflets larger and more oblong, the terminal one 3 in. long by under half as broad, both sides glabrous, the under one subglaucous, similar racemes, stipellæ and bracts, the calyx deeply cleft with four lanceolate acuminate teeth, the pod on a stalk which equals the calyx, 15 lines long by 4–5 lines broad, 4–5-seeded.

54. GLYCINE, Linn.; Benth. et Hook. f. Gen. Plant. i. 530.

Calyx with the two upper teeth more or less connate, the others linear or lanceolate. Standard orbicular, spreading, subauriculate at the base; wings narrow, adhering slightly to the shorter obtuse keel. Stamens monadelphous or diadelphous; anthers uniform, all fertile. Ovary subsessile, multiovulate; style beardless, slightly incurved; stigma terminal capitate. Pod linear, usually compressed, two-valved, septate between the seeds, many rarely two-seeded.—Wide-climbing perennials with leaves usually pinnately trifoliolate.

A small genus, confined to the tropics of the Old World.

Leaves all trifoliolate, seeds many.
  Flowers in copious elongated stalked racemes.
    Terminal leaflet distinctly stalked.
      End leaflet ovate acute . . . . . 1. *G. javanica.*
      End leaflet papyraceous obovate acute . . . . . 2. *G. micans.*
      End leaflet coriaceous obovate blunt . . . . . 3. *G. andongensis.*
    Terminal leaflet subsessile . . . . . 4. *G. Petitiana.*
  Flowers 4–6 in congested subsessile racemes . . . . . 5. *G. hedysaroides.*
  Flowers in pairs in the axils of the leaves . . . . . 6. *G. biflora.*
Leaves simple and trifoliolate intermixed, seeds 2 . . . . . 7. *G. Borianii.*

1. **G. javanica,** *L.*; *DC. Prod.* ii. 242. Stems slender, wide-climbing, more or less densely clothed with silky pubescence. Stipules lanceolate, 2–3 lines, deciduous. Leaflets 3, subcoriaceous, glabrescent above, finely grey downy below; end one ovate, acute, 2–4 in. long; petiolule 3–6 lines; lateral ones very unequal-sided. Flowers in copious usually peduncled axillary racemes 3–6 in. long. Bracteoles linear, equalling the calyx. Pedicels very short. Calyx 2–2½ lines, densely silky, the linear teeth equalling the tube. Corolla bright red slightly exserted. Pod linear, an inch long, 1½–2 lines broad, nearly straight, densely silky, 4–6-seeded.—*G. micrantha*, Hochst. in Schimp. Hb. Abyss. No. 8; A. Rich. Fl. Abyss. i. 212. *G. moniliformis*, Hochst. in Schimp. Hb. Abyss. No. 703; A. Rich. Fl. Abyss. i. 211. *Bujacia anonychia*, E. Meyer, Comm. 127.

Upper Guinea. Banks of the Gaboon, *Mann!*
Nile Land. Sennaar, *Kotschy!* Abyssinia, *Schimper!* and others.
Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*
Mozamb. Distr. Island of Zanzibar, *Bojer!*

Var. β. *G. longicauda*, Schweinf. in Verh. Zool. Bot. Wien, xviii. 658.
Stem and leaves below glabrescent: leaflets larger, reaching 5–6 in. long; racemes longer and laxer; calyx less densely silky.
Nile Land. Abyssinia, *Schweinfurth!*
Lower Guinea. Highlands of Golungo Alto. *Dr. Welwitsch!*
Mozamb. Distr. Lower part of the valley of the Shire, *Dr. Meller!*
Also a plant of Natal and Tropical Asia.

2. **G. micans,** *Welw. mss.* Stems wide-climbing, angular, densely clothed with tawny silky hairs. Stipules lanceolate, deciduous. Petioles reaching 3–5 in.; leaflets 3, papyraceous, obscurely grey-downy above, thinly clothed with adpressed persistent shining grey hairs below; end one obovate, acute, reaching 5–6 in. long; petiolule $\frac{1}{2}$–$\frac{5}{8}$ in.; lateral ones unequal-sided. Racemes copious, very lax, reaching 6–9 in. long, shortly peduncled. Pedicels very short. Calyx $1\frac{1}{2}$–2 lines, densely silky; teeth lanceolate, as long as the tube, upper two connate. Corolla reddish, slightly exserted. Pod linear, 15–18 lines long, slightly recurved, matted with adpressed grey hairs like the leaves below, 8–9-seeded.

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

3. **G. andongensis,** *Welw. mss.* Stems wide-climbing, very slender, densely brown-velvety. Stipules minute lanceolate deciduous. Petioles 12–15 lines, densely velvety; leaflets 3, coriaceous, shining and glabrescent above, thinly clothed with adpressed grey hairs below; end one obovate-oblong blunt, reaching 2–3 in. long; petiolule $1\frac{1}{2}$–2 lines; lateral ones also blunt, slightly unequal-sided. Racemes short, peduncled, very lax, 6–12 in. long. Pedicels very short. Calyx 2 lines, tubular, densely brown-velvety; teeth linear-lanceolate, as long as tube. Corolla pale reddish, slightly exserted. Ovary linear, silky, multiovulate. Pod unknown.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

4. **G. Petitiana,** *Schweinf. mss.* Stems woody, slender, copiously branched, wide-climbing, finely brown-silky. Stipules small, lanceolate. Petioles an inch long, silky; leaves digitately trifoliolate, the central leaflet ovate, 2–3 in. long, the lateral ones unequal-sided, thick and coriaceous, upper surface thinly silky, lower glaucous and densely grey-silky, veins raised and ferruginous. Flowers in lax or dense stalked axillary racemes finally 6–9 in. long. Pedicels a line long. Calyx $2\frac{1}{2}$–3 lines, densely brown-silky; teeth linear, reaching halfway down, the lowest longer than the others. Corolla red, half as long again as the calyx. Pod 1–$1\frac{1}{4}$ in. long, 2 lines broad, linear, nearly straight, densely clothed with spreading brown silky hairs, 5–7-seeded, slightly torulose.—*Johnia Petitiana*, A. Rich. Fl. Abyss. i. 210, t. 40.

Nile Land. Abyssinia, *Petit!*

5. **G. hedysaroides,** *Willd. Sp. Pl.* iii. 1060. Stems shrubby at the base, wide-climbing, terete, pubescent. Stipules small, setaceous. Petiole $\frac{1}{2}$–1 in. long, slender, pubescent; leaflets three, subcoriaceous, oblong, the central one $1\frac{1}{2}$–2 in. long, by about half as broad, rounded at both ends, apex emarginate, its petiolule $\frac{1}{4}$ in. long, lateral ones similar but rather smaller, upper surface glabrescent, the lower densely adpressed grey-silky. Flowers 4–6 together in short-stalked congested axillary racemes. Bracts setaceous. Calyx silky, $2\frac{1}{2}$ lines deep, the teeth linear, reaching two-thirds of the way down. Corolla pale red,

half as long again as the calyx. Pod 18–21 lines long, $\frac{3}{8}$ in. broad, flat, nearly straight, glabrescent, 5–6-seeded.—Schum. et Thonn. Pl. Guin. 345. *Johnia Willdenovii*, Hook. f. Fl. Nigr. 305.

Upper Guinea. Guinea proper, *Thonning, Don! Vogel!*
Lower Guinea. Loanda, *Dr. Welwitsch!*

6. **G. biflora,** *Schum. et Thonn. Pl. Guin.* 345. Stems suffruticose, the branches long, filiform, climbing, terete, pubescent. Stipules ovate, acute, striated, Petioles 1–1½ in. long, pilose; leaflets 3, ovate-oblong, 1–1½ in. long, rounded and mucronate at the apex, subcoriaceous, both sides thinly pilose. Flowers axillary in pairs on a very short common peduncle. Pedicels ½ in. long, pilose, with a pair of setaceous bracteoles at the apex. Calyx pilose, the teeth setaceous, the two upper ones subconnate. Corolla white, half an inch long. Pod linear-oblong, an inch long, mucronate, flattish, quite glabrous, 4–5-seeded.

Upper Guinea. Guinea proper, *Thonning.*
This we have not seen, so that we cannot vouch for its belonging to the genus as here defined.

7. **G. Borianii,** *Baker.* Stems slender, wide-climbing, thinly grey-silky. Stipules linear, 2–3 lines. Petioles ½–1 in.; leaves simple and pinnately trifoliolate intermixed, subcoriaceous, glabrescent above, glaucous beneath with pubescent veins; end or only leaflet oblong, acute, reaching 3–4 in. long; petiolule 3–4 lines. Flowers 12–20 in copious congested subsessile axillary racemes. Pedicels very short. Calyx 2 lines, finely silky; teeth linear, as long as the tube. Corolla red, twice the calyx. Pod linear, thinly silky, 2-seeded, not seen mature.—*Rhynchosia Borianii*, Schweinf. Rel. Kots. 30, t. 23.

Nile Land. Sennaar and Abyssinia, *Schweinfurth!*

55. **TERAMNUS,** Sw.; Benth. et Hook. f. Gen. Plant i. 550.

Calyx with the two upper teeth connate or separate, the others subequal. Standard obovate, narrowed at the base, exappendiculate; wings narrow, adhering to the keel; keel shorter than the wings, almost straight, obtuse. Stamens all connate, the alternate anthers small, abortive. Ovary sessile, multiovulate; style short, thick, beardless; stigma capitate. Pod linear, 2-valved, septate between the seeds, rostrate.—Twining herbs.

A small genus, diffused through the tropics.

1. **T. labialis,** *Spreng. Syst.* iii. 235. Stems slender, firm, wide twining, more or less hairy. Stipules minute, lanceolate. Petioles ½–¾ in. long, silky; leaflets 3, oblong or obovate, 1–1½ in. long, blunt mucronate, the terminal one short-stalked, subcoriaceous, both sides more or less silky. Flowers in lax stalked axillary, or casually sessile abbreviated racemes. Calyx 2 lines long, silky, the segments subequal or the two upper ones subconnate, reaching halfway down. Corolla reddish, slightly exceeding the calyx. Pod linear, 1½–2 in. long, ⅛ in.

broad, slightly recurved, densely silky, 10–12-seeded. — Harv. Fl. Cap. ii. 235. *G. parviflora*, Lam. Enc. ii. 738; DC. Prod. ii. 248. *G. senegalensis*, DC. Prod. l. c. *G. abyssinica*, Hochst. in Schimp. Hb. Abyss. No. 1037; A. Rich. Fl. Abyss. i. 212. *Kennedya arabica*, H. et S. in Schimp. Hb. Arab. No. 900. *Bujacia gamsonychia*, E. Meyer, Comm. 127. *Glycine axilliflora*, Kotschy, Pl. Bind. 17, t. 7.

Upper Guinea. Senegambia, *Heudelot!* Guinea, *Burton!* Princes island, *Barter!*

Nile Land. Nubia, *Kotschy! Binder!* Abyssinia, *Schimper! Quartin-Dillon!* Unyoro, *Speke and Grant!*

Lower Guinea. Golungo Alto, *Dr. Welwitsch!*

Tropics of Old and New World, extending south to Natal. It varies much in pubescence, and is sometimes subglabrous.

56. **ERYTHRINA**, Linn.; Benth. et Hook. f. Gen. Plant. i. 531.

Calyx bilabiate or spathaceous, slit down the base on the lower side, the teeth short or elongated. Standard ample and elongated, erect or patent, subsessile or furnished with a claw, not appendiculate at the base; wings short or none; keel much shorter than the standard, shorter or longer than the wings, its petals often free. Upper stamen free or connate with the others below; anthers uniform. Ovary stalked, multiovulate; style incurved, not dilated, beardless, with a small terminal stigma. Pod stalked, linear, falcate, narrowed at the base and apex, much constricted between the seeds, both sutures or only the upper one splitting.—Erect trees or shrubs often armed with spines. Leaves trifoliolate, with a pair of glands at the base of each leaflet, the lateral leaflets unequal-sided.

A considerable very well-marked genus, widely spread through the warmer regions of both hemispheres.

Calyx campanulate.
- Calyx obliquely truncate . . . . . 1. *E. senegalensis.*
- Calyx bilabiate . . . . . 2. *E. Humei.*

Calyx spathaceous, slit deeply down the keel.
- **Upper lip of calyx short, blunt, entire.**
  - Leaflets hastately lobed; calyx and rachis glabrous . . 3. *E. Livingstoniana.*
  - Leaflets ovate entire; calyx and rachis tomentose . . . 4. *E. Brucei.*
- Upper lip of calyx elongated, shallowly bifid . . . . . 5. *E. excelsa.*
- **Upper lip of calyx elongated 5-lobed.**
  - Lobes short oblong . . . . . 6. *E. suberifera.*
  - Lobes middle size, linear-lanceolate . . . . . 7. *E. huillensis.*
  - Lobes long whip-like . . . . . 8. *E. tomentosa.*

1. **E. senegalensis,** *DC. Prod.* ii. 413. A tree 8–16 ft. high, with woody branches armed with small firm falcate prickles $\frac{1}{8}$ in. long from a dilated base. Stipules deciduous. Petiole 2–3 in. long, woody, glabrous, prickly; leaflets ovate-oblong, terminal one 4–5 in. long, 2–$2\frac{1}{2}$ in. broad, coriaceous, both sides glabrous. Flowers in short-stalked lax racemes 6–9 in. long, the axis pubescent, the lower ones fascicled in threes. Bracts $\frac{1}{4}$ in. long, linear, pubescent, deciduous. Pedicels 2 lines long, pubescent. Calyx 4–5 lines deep, the mouth

oblique to a shallow slit at the keel. Corolla bright crimson; standard obovate-oblong, $\frac{1}{2}$ in. broad, protruding an inch beyond the calyx, the wings equalling the calyx, the keel shorter. Pod 4–5 in. long, $\frac{3}{8}$–$\frac{1}{2}$ in. thick, consisting of 4–6 globes enclosing a seed each, with a long pedicel and deep constrictions between them.—Guill. et Perr. Fl. Seneg. 224. *E. latifolia*, Schum. et Thonn. Pl. Guin. 333. *E. guineensis*, G. Don, Gard. Dict. ii. 371. *E. Vogelii*, Hook. f. Fl. Nigr. 367. *Macrocymbium Vogelii*, Walp. in Flora, 1853, 149.

Upper Guinea. Senegambia, *Leprieur and Perrottet, Whitfield!* Sierra Leone, *Afzelius! Don! Hutton! Dr. Kirk!* Guinea proper, *Thonning*, and others.

Flowers contemporaneous with the leaves. A specimen without flowers and fruit, gathered in Abyssinia by Petit, is referred here by A. Richard. The genus *Macrocymbium* of Walpers owes its origin to a misprint in the description of *E. Vogelii* in the Niger Flora.

2. **E. Humei,** *E. Meyer, Comm. Pl. Afr. Austr.* 150. A tree 10–20 ft. high, with woody branches armed with strong straight conical prickles $\frac{1}{4}$ in. long. Stipules deciduous. Petioles 3–5 in. long, glabrous, prickly; leaflets casually 5, terminal one on a prickly stalk $1\frac{1}{2}$–3 in. long, the blade rhomboidal 3–5 in. each way, or sometimes subhastate, acute or bluntish, coriaceous, both sides glabrous. Racemes dense, 3–6 in. long on woody peduncles as long or longer. Calyx 4–5 lines deep, slightly silky, shallowly bilabiate, the lips often a little toothed. Standard bright scarlet, protruding an inch or more beyond the calyx, half an inch broad; wings and keel equal, shorter than the calyx. Pod 5–6 in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. thick, consisting of 5–6 globes enclosing a seed each, with a long stalk at the base and deep constrictions between them.—Harv. Fl. Cap. ii. 237. *E. Caffra*, DC. Prod. ii. 412, in part, non Thunb.; Bot. Reg. t. 736; Bot. Mag. t. 2431. *E. hastifolia*, Bert. Illust. Pl. Mozamb. t. 2, fig. A.

Mozamb. Distr. Sofala, Inhambane, *teste Bertoloni.* Zambesi land, Manganya hills and between Tette and the sea-coast, *Dr. Kirk! Dr. Meller!*

A plant of Natal. Flowers contemporaneous with the leaves.

3. **E. Livingstoniana,** *Baker.* A large tree with a prickly stem and firm glabrous branches. Petiole 3–4 in. long, slender, glabrous, slightly prickly; leaflets 3, the terminal one hastate, 4 in. each way, the central lobe deltoid, the lateral ones subquadrangular, the sinuses shallowly rounded, the petiolule 2 in. long, lateral ones similar on short petioles, both sides glabrous. Flowers in dense racemes half a foot long on long glabrous woody peduncles. Pedicels thick, glabrous, 2 lines long. Calyx $\frac{3}{4}$ in. deep, glabrous, coriaceous, entire, spathaceous, slit down to the base on the lower side. Standard red, twice as long as the calyx, $1\frac{1}{2}$ in. broad; wings round, 4 lines each way; keel equalling the wings. Pod 5–6 in. long, stipitate, consisting of 5–6 1-seeded globes 6–8 lines thick, some abortive.

Mozamb. Distr. Zambesi land, sixty miles up the river Shire, *Dr. Kirk!*

4. **E. Brucei,** *Schweinf. in Verh. Zool. Bot. Wien*, xviii. 653. A small tree with stout rugose branches armed with short strong spines. Pe-

tioles prickly, 2–3 in. long; leaflets ovate, the central one 3–4 in. long on a petiolule above an inch long, lateral smaller, slightly oblique, subsessile. Racemes half a foot long, densely flowered, the rachis and pedicels densely clothed with dark brown woolly tomentum. Calyx 9–12 lines long, densely brown-tomentose, finally slit down to the base, the upper lip entire. Standard more than twice as long as the calyx, oblong-spathulate, externally tomentose. Pod 3–4 in. long, with 3–4 seeds.—*Kuara*, Bruce's Travels, vii. t. 19. *E. senegalensis*, A. Rich. Fl. Abyss. i. 213?

Nile Land. Abyssinia.
Known only by Bruce's figure and flowering specimens without leaves gathered by Steudner.

5. **E. excelsa,** *Baker*. A tree 60–80 ft. high with glabrous branches with numerous sharp straight short prickles. Petioles 4–6 in. long, slender glabrous, slightly prickly; leaves not contemporaneous with the flowers; central leaflet broad-ovate or obovate, 8–9 in. long by rather less broad, the veins sometimes prickly, the petiolule 3 in. long, the lateral ones sometimes imbricated, subcoriaceous, both sides glabrous. Flowers in dense racemes half a foot long on thick woody peduncles. Pedicels 2–3 lines long, glabrous. Calyx $1\frac{1}{2}$ in. long, spathaceous, coriaceous, glabrous, the outer two-thirds subligulate, the apex bifid, the lower side slit down to the base. Corolla bright scarlet, the standard nearly equalling the calyx, the wings and keel not more than 3 lines deep, and the former $\frac{1}{8}$ in. broad. Pod not seen.

Upper Guinea. Ambas bay, *Mann!* Banks of the Niger, *Barter!*

6. **E. suberifera,** *Welw. mss.* A tree reaching 15–25 ft. high, with very thick corky spinose grey branches. Petioles reaching 6–7 in. long, sparsely muricated; leaflets subcoriaceous, always glabrous above, when young matted closely with deciduous brownish tomentum below; central one broader than deep, blunt, not at all lobed, reaching 6–8 in. long; petiolule 2–$3\frac{1}{2}$ in. Flowers in dense racemes 2–5 in. long on woody densely grey-pubescent peduncles which exceed them. Bracts linear, deciduous. Bracteoles setaceous, 3–4 lines. Calyx 9–10 lines, grey-pubescent, slit more than halfway down on the lower side, the upper lip cut into five thickened oblong lobes not more than $\frac{1}{8}$ in. long. Standard 16–18 lines long, 6–7 lines broad. Pod falcate, 3–4 in. long, 6–8-seeded, densely velvety when young, not seen mature.

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

7. **E. huillensis,** *Welw. mss.* An erect comose tree 8–15 ft. high, the old branches terete, comparatively slender, armed with numerous straight spines, the young ones angular, sulcate, densely clothed with grey pubescence. Stipules lanceolate, pubescent, $\frac{1}{4}$ in. long. Petioles 2–3 in. long, finely downy, slightly prickly; leaflets coriaceous, matted on both sides with close brown tomentum when young, glabrescent above when mature; central one blunt, 3–$3\frac{1}{2}$ in. long and broad,

the sides rounded, faintly repand; petiolule $1\frac{1}{4}$–2 in. long. Flowers in dense racemes 4–5 in. long, equalling the woody downy peduncles. Bracts lanceolate deciduous. Pedicels very short, tomentose. Bracteoles setaceous, 2–3 lines. Calyx 12–15 lines, thinly pubescent, slit more than halfway down on the lower side, the upper lip cut into five linear twisted teeth 3–4 lines long. Standard scarlet, 18–21 lines. Pod 2–3-seeded, densely clothed with close brown velvety tomentum when young, not seen mature.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

8. **E. tomentosa,** *R. Br. in Salt, Abyss. App.* 63 (name only). A tree 10–20 ft. high with woody spinose branches densely clothed with fine grey tomentum. Stipules lanceolate, $\frac{1}{4}$–$\frac{3}{8}$ in. long. Petioles 4–6 in. long, densely grey-tomentose, spinose; leaflets roundish or broad-ovate, thickly subcoriaceous; terminal one 4–6 in. each way, sometimes broader than deep, blunt, the base broadly rounded or cordate; petiolule 2–3 in. long; both sides matted with grey tomentum. Flowers in dense racemes 2–4 in. long on woody peduncles 6–8 in. long. Pedicels 2–3 lines long, very woolly. Calyx 1–$1\frac{1}{4}$ in. long, tomentose on the back, slit down nearly to the base on the underside, cut more than a third down on the upper side into five whip-like laciniæ. Corolla bright scarlet, the standard as long or rather longer than the calyx, half an inch broad, wings $\frac{3}{8}$ in. long, keel shorter. Pod 4–5 in. long, subligneous, consisting of about 6 close 1-seeded globes 7–8 lines thick, the base distinctly-stalked, the faces velvety, the upper suture finally splitting.—Hochst. et Steud. in Schimp. Hb. Abyss. No. 531; A. Rich. Fl. Abyss. i. 213. *E. pelligera,* Fenzl, in Flora, 1844, 312. *E. latissima,* E. Meyer, Comm. 151; Harv. Fl. Cap. ii. 238. *E. Sandersoni,* Harv. Thes. t. 61–2. *Chirocalyx mollissima,* Meissn. in Hook. Lond. Journ. ii. 98.

Nile Land. Nubia, *Kotschy! Petherick! Binder.* Abyssinia, *Schimper! Quartin-Dillon and Petit.* Karaguè, *Speke and Grant!*

Mozamb. Distr. Zambesi land, *Dr. Kirk, Dr. Meller!*

Also a plant of Natal.

The plant figured in fruit by A. Richard, under the name of *E. abyssinica,* Lam., and in flower in *Plantæ Tinneanæ, tab.* 3, under the name of *Chirocalyx abyssinicus,* does not appear to differ from this in anything except its less tomentose leaves. If Lamarck's name be rightly applied, of course it will have to take precedence.

57. **MUCUNA,** Adans.; Benth. et Hook. f. Gen. Plant. i. 533.

Upper teeth connate, the lowest longest. Standard folded together, shorter than the wings, with inflexed auricles at the base; wings oblong or ovate, incurved, often adhering to the keel; keel equalling or longer than the wings, incurved at the apex, acute or rostrate. Upper stamen free, the rest connate; anthers alternately longer and fixed at the base, and shorter, versatile, often bearded. Ovary sessile, villous, pauciovulate; style filiform, beardless; stigma small, terminal. Pod thick, linear or ovate-oblong, often clothed with stinging hairs, two-valved, septate between the seeds, the valves coriaceous, plane or

variously costate or lamellate.—Climbing herbs or shrubs (one species erect) with pinnately trifoliolate stipellate leaves, the lateral leaflets very unequal-sided.

A moderately small genus, widely dispersed through the tropics.

§ **Citta.** Pod transversely lamellate.

Pods armed with stinging bristles.
Flowers in capitate heads on short firm peduncles . . . 1. *M. urens.*
Flowers in elongated racemes on very long slender peduncles . . . . . 2. *M. flagellipes.*
Pods without stinging bristles . . . . . 3. *M. cylindrosperma.*

§§ **Carpopogon.** Pods with a pair of broad wings at the upper and lower sutures . . . . . 4. *M. quadrialata.*

§§§ **Stizolobium.** Pods neither winged nor lamellate.
Climbers.

Flowers in ample racemes . . . . . 5. *M. melanocarpa.*
Flowers in capitate heads.
Calyx 3–4 lines deep, leaves herbaceous . . . . . 6. *M. pruriens.*
Calyx 6–8 lines deep, leaves coriaceous . . . . . 7. *M. coriacea.*
An erect much-branched shrub . . . . . 8. *M. stans.*

1. **M. urens,** *DC. Prod.* ii. 405. Stem woody, slender, wide-climbing, the young shoots thinly adpressed-silky. Stipules small, lanceolate, deciduous. Petioles 4–5 in. long, firm, subglabrous; leaflets 3, papyraceous, central one ovate-oblong, 3–5 in. long, cuspidate; petiolule an inch long; lateral ones usually larger and very unequal-sided, upper surface with a few deciduous adpressed bristly hairs, lower permanently finely shining grey-silky. Flowers in capitate heads on firm axillary peduncles. Bracteoles cymbiform, grey-silvery, an inch or more long, deciduous. Pedicels 3–4 lines long, cernuous. Calyx broad-campanulate, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, silvery and scattered over with deciduous yellow bristles; upper lip rounded, entire; lower trifid with the central tooth longer than the others reaching a quarter down. Corolla sulphur-yellow, the wings and broad keel 2 in. or more long, the standard much shorter. Pod oblong, 5–6 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad, nearly straight, with close broad irregular coriaceous undulated lamellations 1–3 lines broad, and yellow bristly hairs in the hollows. Seeds 2–3.—Benth. in Mart. Fl. Bras. xxiv. t. 46, fig. 1. *Stizolobium urens*, Pers. Syn. ii. 299.

Upper Guinea. Guinea proper, *Thonning, G. Don! Barter!* Fernando Po, *Vogel! Mann!*
Cosmopolitan in the tropics.

2. **M. flagellipes,** *Vogel in Hook. Fl. Nigr.* 307. Stems firm, slender, glabrous, wide-twining, climbing to a length of 60 or 70 ft. Stipules small, lanceolate, deciduous. Petioles 4–5 in. long, firm, slender, glabrous; leaflets subcoriaceous, the central one ovate-oblong, 3–6 in. long, 2–3 in. broad, cuspidate or acuminate, the base rounded; petiolule $1\frac{1}{2}$ in. long; the lateral ones larger and very unequal-sided, both sides glabrous. Flowers in lax racemes on a firm zigzag rachis on firm slender glabrous elongated peduncles sometimes 6 or 7 ft. long.

Bracteoles cymbiform, grey-silky, an inch or more long, deciduous. Pedicels 4–5 lines long, cernuous. Calyx broad-campanulate, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, adpressed grey-silvery and scattered over with deciduous yellow bristles, the upper lip rounded entire, the lower with three short deltoid teeth. Corolla pale yellow, protruding an inch beyond the calyx. Pod oblong, 4–5 in. long, $1\frac{1}{2}$ in. thick, coriaceous, lamellated and bristly as in the preceding, 2–3-seeded.

Upper Guinea. Plentiful on the banks of the Nun, *Vogel!* Fernando Po, *Barter! Mann!*

The whole plant turns black like the preceding when dried. A specimen gathered by Mann at Fernando Po not unlikely represents a distinct species. The pod is subligneous, 7–8 in. by more than 2 in. broad, 4-seeded, and the lamellations are reduced to mere ribs. The peduncle is stated to be 7 ft. long, and the leaf agrees precisely with that of *M. flagellipes.*

3. **M. cylindrosperma,** *Welw. mss.* A wide-climbing shrub, the ultimate branches glabrous, scarcely more than herbaceous. Stipules minute, lanceolate, reflexed, persistent. Petioles $2\frac{1}{2}$–3 in.; leaflets membranous, both sides quite glabrous; end one ovate acute 4–5 in. long; petiolule 10–12 lines; lateral ones very unequal-sided. Racemes and flowers not known. Pod 6–7 in. long, 1 in. broad, narrowed at both ends, with numerous oblique lamellæ and no stinging bristles; seeds 2–3, oblong, chestnut-brown, $1\frac{1}{4}$ in. long.

Lower Guinea. Golungo Alto, *Dr. Welwitsch!*

4. **M. quadrialata,** *Baker.* Stems woody, wide-climbing, slender, glabrous. Stipules deciduous. Petioles 2–3 in. long, firm, slender, glabrous; leaflets subcoriaceous, the central one ovate-oblong, 4 in. long, subacute, base rather rounded; petiolule under an inch long, both sides glabrous. Flowers in capitate clusters of about a dozen each on short woody glabrous peduncles. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. long, thinly silvery, with a pair of linear-oblong bracteoles adpressed to and exceeding the calyx. Calyx 5 lines deep, shallowly bilabiate, densely adpressed yellow-bristly; teeth very short. Standard orbicular, protruding $\frac{3}{4}$ in. beyond the calyx, the keel in the fully expanded flower protruding $1\frac{1}{2}$ in. Pod coriaceous, 4–5 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad including the wings, narrowed to the base, rostrate, with two broad coriaceous wings both above and below, the faces flattened, densely adpressed yellow-bristly, 2–3-seeded.

Mozamb. Distr. Zambesi land, *Dr. Kirk!* Island of Zanzibar, *Dr. Kirk.*

5. **M. melanocarpa,** *Hochst. in Schimp. Hb. Abyss.* No. 1425. Stem woody, wide-climbing, slender, glabrous. Stipules deciduous. Petiole 4–5 in. long, firm, slender, glabrous; leaflets subcoriaceous, the central one broadly obovate, 3–5 in. long, blunt or acute, the base narrowed or subcuneate; petiolule more than an inch long; upper surface glabrous, lower finely ferruginous-pubescent. Flowers in dense racemes 6–12 in. long on firm glabrous peduncles. Pedicels $\frac{1}{4}$ in. long, cernuous. Calyx broadly campanulate, $\frac{3}{8}$ in. deep, thinly silvery and yellow-

bristly, bilabiate, the teeth short-deltoid. Corolla 2 in. long, the wings and keel nearly equal, the standard a little shorter, $\frac{3}{4}$ in. broad. Pod like that of *M. pruriens*, densely coated with brown silky bristles.—A. Rich. Fl. Abyss. i. 215.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*

6. **M. pruriens,** *DC. Prod.* ii. 405. Stems herbaceous, wide-climbing, subglabrous, stipules linear. Petioles 2–6 in. long, firm, subglabrous; leaflets membranous, not turning black when dried; the central one ovate-rhomboidal, 4–5 in. long, broad, bluntish with a mucro, upper surface glabrous, lower thinly silky. Flowers in short-stalked copious racemes. Bracts linear, deciduous. Pedicels silvery, cernuous, 2 lines long. Calyx broad-campanulate, 3–4 lines deep, silvery, the upper lip deltoid, reaching halfway down, the lower three-toothed. Corolla $1\frac{1}{4}$–$1\frac{1}{2}$ in. deep, dark purple, the standard half as long as the wings. Pod 2–3 in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. thick, densely clothed with brown silky bristles, longitudinally ribbed, 5–6-seeded.—*Carpopogon pruriens*, Roxb. Fl. Ind. iii. 283. *Stizolobium pruriens*, Pers. Syn. ii. 299.

Upper Guinea. Sierra Leone, *Morson! Afzelius!* Nupe, *Barter!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Cosmopolitan in the tropics.

7. **M. coriacea,** *Baker.* Stems woody, wide-climbing, clothed with fine grey pubescence. Stipules deciduous. Petiole $1\frac{1}{2}$–2 in. long, firm, finely pubescent; leaflets coriaceous, the central one obovate-oblong, 2–3 in. long, blunt with a mucro, base rounded, both sides finely grey-pubescent. Flowers 12–20 in short axillary racemes on firm woody pubescent peduncles 2–4 in. long. Pedicels $\frac{1}{4}$ in. long, silky. Calyx broad-campanulate, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, densely grey and tawny-silky, cleft halfway down, the upper lip deltoid emarginate, the three lower teeth lanceolate. Corolla deep purple, the keel more than $1\frac{1}{2}$ in. long, the wings slightly shorter, standard rather shorter than the wings, $\frac{1}{2}$ in. broad, protruding $\frac{5}{8}$–$\frac{3}{4}$ in. beyond the calyx. Ovary linear, densely bristly towards the keel, resembling that of *M. urens*. Pod not seen.

Mozamb. Distr. Zambesi land, Shupanga, *Dr. Kirk! Dr. Stewart!* Manganya hills, *Dr. Meller!*

8. **M. stans,** *Welw. mss.* A very much branched erect shrub 5–6 ft. high, with terete branches thinly coated with adpressed grey-silky hairs. Stipules deciduous. Petioles 12–15 lines; leaflets subcoriaceous, glabrescent above, clothed with adpressed grey-silky hairs below; end one oblong, 2–3 in. long, blunt, mucronate; petiolule 6–9 lines. Flowers 6–10 in copious short-stalked axillary racemes. Pedicels 3–6 lines densely grey-silky. Calyx $\frac{1}{2}$ in. deep, grey-velvety; teeth lanceolate as long as tube. Corolla $1\frac{1}{2}$ in. deep; keel three times the calyx. Pod $1\frac{1}{2}$–2 in. long, $\frac{1}{2}$ in. broad, recurved towards the point, 2–4-seeded, densely clothed with fragile adpressed brownish bristles.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

58. **SPATHOLOBUS,** Hassk.; Benth. et Hook. f. Gen. Plant. i. 534.

Upper two teeth of calyx subconnate, the others equal. Standard ovate, obtuse, exappendiculate; wings linear-oblong; keel nearly straight, obtuse, equalling the wings. Upper stamen usually free, but in our plant connate with the others; anthers uniform. Ovary sessile, biovulate; style incurved, beardless; stigma small, terminal. Pod subsessile or stipitate, linear-oblong, often falcate, flat and indehiscent in the lower part, the apex convex, single-seeded and dehiscing.—Wide-climbing shrubs.

A small genus, the other species all Tropical Asiatic.

1. **S. ? africanus,** *Baker*. Stems firm, woody, climbing to a length of 100 ft., the young branches slightly grey-tomentose. Petioles 4–5 in. long, firm, woody, tomentose; leaflets 3, central one obovate, 5–6 in. long, 3–4 in. broad, slightly repand upwards, apex blunt, emarginate, base subcuneate, coriaceous, upper surface glabrous, lower finely grey-pubescent all over, veins and veinlets raised. Flowers in ample panicles 1–2 ft. long with narrow racemose branches, the lower ones stalked and often half a foot long. Pedicels very short, with two small rounded bracteoles at the apex adpressed to the calyx, which is almost tubular, 2 lines deep, densely adpressed grey-silvery, teeth very short, subdeltoid. Corolla scarlet, three times the calyx. Ovary linear, sessile, slightly silky. Pod not seen.

Upper Guinea. Fernando Po, *Mann!*

This closely resembles the common East Indian *Butea parviflora* of Roxburgh in its ample panicles and the shape and texture of its leaves, but the corolla is smaller, the calyx less deeply toothed, and the stamens are monadelphous.

59. **GALACTIA,** P. Br.; Benth. et Hook. f. Gen. Plant. i. 535.

Calyx-teeth acuminate, the two upper ones connate, the lowest rather longer than the others. Standard ovate or orbicular, subappendiculate or the edges at the base inflexed; wings narrow or obovate, adhering to the keel; keel equalling or exceeding the wings, not beaked. Upper stamen free, or connate with the others at the middle; anthers uniform. Ovary subsessile, multiovulate; style filiform, beardless; stigma small, terminal. Pod linear, straight or incurved, compressed, two-valved, thinly septate between the seeds.—Prostrate or climbing herbs or erect shrubs.

A moderate sized tropical genus, with its head quarters in America.

1. **G. tenuiflora,** *Wight et Arn. Prod. Fl. Ind.* 206. Stems slender, firm, wide-twining, finely grey-pubescent. Stipules small, lanceolate, deciduous. Petioles slender, 1–2 in. long; leaflets 3, the central one oblong, 2–2½ in. long, both ends rounded; petiolules ⅜–½ in. long; lateral ones slightly unequal-sided; texture subcoriaceous, thinly grey-

pubescent beneath, the veinlets raised. Flowers in very lax 4–8-flowered racemes on firm slender peduncles 2–4 in. long. Bracts small, rigid, deciduous. Calyx $\frac{1}{4}$ in. long, thinly silky; teeth lanceolate acuminate, reaching more than half down. Corolla yellow, twice the calyx. Pod 2 in. long, slightly curved, 7–8-seeded.—Harv. Fl. Cap. ii. 235. *G. villosa*, Wight et Arn. l.c. *Copisma subsericeum*, Sond. in Linnæa, xxiii. 34. *G. mucronata*, Klotzsch in Peters' Mossamb. Bot. 38.

Mozamb. Distr. Zambesi land, *Dr. Peters!*
Also a plant of the Cape, the Mascarene isles, and East Indies.

60. **DIOCLEA**, H.B.K.; Benth. et Hook. f. Gen. Plant. i. 536.

Calyx with the two upper teeth connate, the lateral ones small, the lowest longer. Standard orbicular, reflexed, the base with a pair of inflexed auricles; wings obovate or oblong, free, rather longer than the keel; keel incurved, subrostrate. Upper stamen free at the base, connate with the others at the middle, anthers uniform, the alternate ones in our species small and abortive. Ovary subsessile, bi- or multi-ovulate; style incurved, beardless, dilated upwards; stigma truncate, terminal. Pod linear, oblong, compressed, nearly flat, coriaceous, 2-valved, upper suture dilated, septate between the seeds.—Twining shrubs.

A moderately small genus, almost entirely Tropical American.

1. **D. reflexa,** *Hook. f. Fl. Nigr.* 306. Stems woody, climbing to a height of 20 ft., terete, clothed with long spreading fine deciduous yellowish-grey hairs. Stipules $\frac{1}{2}$–$\frac{3}{4}$ in. long, scariose, peltate. Petioles 2–3 in. long; leaflets 3, stipellate, central one obovate-oblong, 4–6 in. long; base rounded, the apex cuspidate; lateral ones similar, sub-coriaceous, upper surface glabrous, lower thinly and deciduously silky. Flowers in moderately dense racemes 4–6 in. long, on firm peduncles often as long. Bracts $\frac{1}{2}$ in. long, lanceolate or linear. Pedicels $\frac{1}{8}$ in. long with a pair of short rounded bracteoles at the apex. Calyx $\frac{3}{8}$ in. deep, tawny silky, upper lip blunt, emarginate, lower with central tooth lanceolate, reaching halfway down, the others deltoid. Corolla red, half as long again as the calyx. Pod coriaceous, broad-oblong, 3–4 in. long, 2 in. broad, densely clothed with yellowish-grey silky hairs when young, 1–2-seeded.—Benth. in Mart. Fl. Bras. xxiv. 162. *Dolichos coriaceus*, Graham in Wall. Cat. No. 5562.

Upper Guinea. Guinea proper, *Vogel! Mann!* Prince's island and Fernando Po, *Vogel! Barter!*
Lower Guinea. Golungo Alto, *Dr. Welwitsch!*
A plant of both Tropical Asia and America.

61. **CANAVALIA**, Adans.; Benth. et Hook. f. Gen. Plant. i. 537.

Calyx bilabiate, the upper lip large, truncate or bifid, the lower one shorter, entire or trifid. Standard large, suborbicular, reflexed, with

inflexed auricles; wings narrow, free, falcate or subtwisted; keel broader than the wings in our species obtuse. Upper stamen free below, connate at the centre; anthers uniform. Ovary substipitate, multiovulate; style incurved; stigma small, terminal. Pod linear-oblong, compressed or subturgid, with a wing or rib on both sides near the upper suture, 2-valved, slightly septate between the seeds.—Climbing herbs.

A small genus, widely spread through the Tropics.

Biennial, the upper lip of the calyx a quarter as long as the tube . 1. *C. obtusifolia.*
Perennial, the upper lip of the calyx a third as long as the tube . . 2. *C. ensiformis.*

1. **C. obtusifolia,** *DC. Prod.* ii. 404. Stem biennial, climbing or sometimes prostrate amongst the sands of the seashore, slightly pubescent when young. Stipules small, deciduous. Petioles 2–3 in. long, firm, glabrous; leaflets 3, central one roundish or broad-obovate, 3–4 in. long and nearly as broad, apex rounded, often emarginate, petiolule 1–1½ in. long, lateral ones similar, often unequal-sided, shortly petiolulate, both sides glabrous. Flowers in lax 6–12-flowered racemes on long flexuose glabrous peduncles. Pedicels stout, 2–3 lines long, springing from fleshy tubercles. Calyx broad-campanulate, glabrous, ½ in. deep, the upper lip projecting ⅛ in. beyond the lower one, rounded, bifid, the lower with three small deltoid teeth. Corolla purplish, fragrant, three times as long as the calyx, the standard ¾–1 in. broad, Pod 4–6 in. long, an inch broad, 6–8-seeded, glabrous when mature, with two prominent ribs a line distant from the upper suture. Seeds chestnut-brown, opaque, compressed, ½–¾ in. long.—Guill. et Perr. Fl. Seneg. 223. Harv. Fl. Cap. ii. 238. Mart. Leg. Bras. t. 48. *D. obovatus*, Schum. et Thonn. Pl. Guin. 341. *D. ovalifolius*, S. et T. l.c.? *C. emarginata*, G. Don, Gard. Dict. ii. 362.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Leprieur and Perrottet!* Guinea proper, *Thonning, Barter! Mylne!*

Lower Guinea. Congo and Loanda, *Dr. Welwitsch!*

Mozamb. Distr. Mozambique, *Peters.* Zambesi land, *Dr. Kirk!*

Widely dispersed through the Tropics of both hemispheres and often cultivated. It is a plant of Natal.

2. **C. ensiformis,** *DC. Prod.* ii. 404. Stems perennial, wide-climbing, subglabrous. Stipules minute, deciduous. Petiole 2–6 in.; leaflets 3; central one ovate or oblong, 3–6 in. long; lateral ones smaller, unequal-sided, membranous, glabrescent. Flowers numerous, in moderately dense racemes on flexuose peduncles half a foot or more long. Calyx ½ in. deep, the bifid upper lip a third as long as the tube. Corolla pinkish or white, fragrant, twice the calyx or more. Pod short-stalked, 4–8 or even 12 in. long, 15–18 lines broad, glabrescent, the prominent ribs 1½–2 lines from the upper suture.—*C. gladiata*, DC. loc. cit. *C. polystachya*, Schweinf. Rel. Kots. 25, t. 20. *Dolichos Cienkowskii*, Schweinf. et Asch. Enum. 256.

Upper Guinea. Senegal, *Perrottet!* Sierra Leone, *Afzelius!* Niger country, *Barter!*

Nile Land. Sennaar and Abyssinia, *Schweinfurth!* Chopeh (628), *Speke and Grant!*

Lower Guinea. Loanda, Golongo Alto and Pungo Andongo, *Dr. Welwitsch!*

Var. β *C. mollis*, Wall. Cat. No. 5523.

Stems, petioles, and leaves densely pubescent, the latter smaller and thicker in texture than in the type.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

Like the preceding widely dispersed through the tropics of both hemispheres, and often cultivated.

62. **PHYSOSTIGMA,** Balfour; Benth. et Hook. f. Gen. Plant. i. 538.

Calyx with very short teeth, the two upper ones subconnate. Standard suborbicular, recurved, emarginate, appendiculate at the base with inflexed auricles; wings obovate-oblong, incurved, free; keel obovate, with a spirally twisted beak. Upper stamen free, appendiculate near the base; anthers uniform. Ovary stalked, 2–3-ovulate; style thickened within the beak of the keel and twisted with it; stigma oblique, covered by a hood. Pod linear-oblong, convex, 2-valved, thinly septate between the seeds.

A single species, restricted to West Tropical Africa.

1. **P. venenosum,** *Balfour in Trans. Roy. Soc. Edinb.* xxii. 310, t. 16–17. Stem shrubby below, the branches glabrous, slender, climbing to a length of fifty feet. Stipules minute, deciduous. Petioles 2–3 in. long, glabrous; leaflets 3, central one broad-ovate, 4–5 in. long, 3–4 in. broad, cuspidate, the base rounded or cordate, petiolule an inch long, lateral ones smaller, unequal-sided, both sides glabrous. Flowers in short-stalked lax drooping racemes 3–4 in. long. Pedicels short, glabrous, springing 2–3 together from fleshy tubercles as in *Canavalia*. Calyx 3–4 lines deep, glabrous, the teeth subdeltoid, not so deep as broad, short-ciliated. Flowers pale pink, beautifully veined, the folded standard enveloping the rest of the flower and curved round so that it comes near the side of the calyx, the spire $\frac{3}{4}$ in. broad, considerably exceeding the wings and keel. Pod 5–7 in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. thick, the valves horny, glabrous, narrowed at both ends. Seeds 2–3, ovoid-oblong, polished chestnut-brown, $1\frac{1}{4}$ in. long.

Upper Guinea. Old Calabar, *Rev. W. C. Thomson! Hutchinson!*

For a full account of the manner in which it is employed as an ordeal, reference must be made to Professor Balfour's paper.

63. **PHASEOLUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 538.

Upper teeth of calyx free or connate, the others deltoid or lanceolate. Standard orbicular, recurved or subtwisting, the edges inflexed towards the base: wings obovate or rarely oblong, equalling or exceeding the standard, adhering to the keel above the claw, often twisted; keel linear or obovate, with a long obtuse spirally twisted beak. Upper stamen free, often incrassated or appendiculate above the base, the rest

connate; anthers uniform. Ovary subsessile, multiovulate; style incrassated within the beak of the keel and twisted with it, usually longitudinally bearded upwards; stigma oblique. Pod linear or falcate, terete or compressed, two-valved, thinly septate between the seeds.—Usually climbing herbs with pinnately trifoliolate leaves.

A large genus, principally tropical.

Leaflets entire.
- Pod oblong, 2–4-seeded . . . . . 1. *P. lunatus.*
- Pod linear, 10–15-seeded.
  - Pods flat, half an inch broad.
    - Flowers in copious racemes on long peduncles . . . . . 2. *P. adenanthus.*
    - Flowers 2–3 together on short peduncles . . . . . 3. *P. vulgaris.*
  - Pods terete, under ¼ in. thick.
    - Stems robust, not climbing . . . . . 4. *P. Mungo.*
    - Stems slender, twining.
      - Petioles 2–6 in. long, ferruginous-silky . . . . . 5. *P. trinervius.*
      - Petioles under 1 in. long, glabrous . . . . . 6. *P. Kirkii.*

Leaflets deeply sinuato-lobate . . . . . 7. *P. trilobus.*

1. **P. lunatus,** *Linn.; DC. Prod.* ii. 293. Stems biennial, usually twining, glabrous or slightly pubescent. Stipules small, lanceolate-subulate, not peltate. Petioles 2–3 in. long, firm, subglabrous; leaflets 3, the central one ovate-deltoid, 3–4 in. long, 2–3 in. broad, acute, the lateral ones very unequal-sided, both sides subglabrous. Flowers in copious long- or short-stalked axillary racemes 1–4 in. long. Bracts minute, setaceous. Pedicels 2–3 lines long, glabrous or pubescent. Calyx broadly campanulate, 1–1½ lines deep; teeth very short, subdeltoid. Corolla violet or white, under half an inch deep. Pod 2–3 in. long, ½–¾ in. broad, flat, glabrous, rostrate, the upper suture slightly and the lower much recurved; seeds 2–4, purple or white.—*P. bipunctatus,* Jacq. Hort. Vind. t. 100.

Upper Guinea. Fernando Po, *Vogel!* Sierra Leone, *Afzelius!* Annabon, *Capt. Burton!*
Nile Land. Kazeh, *Speke and Grant!*
Lower Guinea. Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Banks of Lake Nyassa, *Dr. Kirk!*
Widely dispersed through the Tropics of both hemispheres.

2. **P. adenanthus,** *E. Meyer, Prim. Fl. Esseq.* 239. Stems firm-herbaceous, wide-climbing, subglabrous. Stipules 2 lines deep, broad-ovate, erect, persistent. Petioles 2–3 in. long; leaflets 3; central one ovate, 3–4 in. long, lateral ones unequal-sided, the veins beneath slightly rufo-pubescent. Flowers 6–12 in axillary moderately dense racemes on peduncles exceeding the leaves. Calyx ¼ in. deep, campanulate, bilabiate, the upper lip emarginate, the lower trifid, with acute teeth. Corolla ¾ in. deep, rose-red, rarely yellow, the wings equalling the standard. Pod 4–5 in. long, 5–6 lines broad, linear, compressed, scarcely pubescent, slightly arcuate, rostrate; seeds 12–15.—*P. senegalensis,* Guill. et Perr. Fl. Seneg. p. 217. *P. truxillensis,* H. B. K. Nov. Gen. vi. 451. Benth. in Mart. Fl. Bras. fasc. 23, 186. *P. rostratus,* Wall. Pl. Asiat. Rar. i. 56, t. 63. Wight, Ic. t. 34. *P. cirrhosus,*

H.B.K. *P. Cumingii, subtortus*, and *brevipes*, Benth. in Ann. Mus. Vind. ii. 1359.

Upper Guinea. Senegambia, *Perrottet!* Sierra Leone, *Afzelius!* Banks of the Bonny, *Mann!* Seashore at Brass, *Barter!*

Nile Land. Nubia, *Binder* (flowers orange). Banks of the White Nile (*teste Schweinfurth*).

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

Cosmopolitan in the Tropics.

3. **P. vulgaris,** *Linn.; DC. Prod.* ii. 392. Stems annual, wide-climbing, subglabrous. Leaflets three, the central one broad-ovate, 4–5 in. long, acute, both sides subglabrous. Peduncles in pairs, 1–2 in. long, 2–3-flowered. Pedicels 2–4 lines; bracteoles ovate. Calyx campanulate, $\frac{1}{4}$ in. deep, upper lip truncate, lower 3-toothed. Córolla white or lilac, an inch deep. Pod 4–5 in. long, $\frac{1}{2}$ in. broad, nearly straight, compressed, glabrous, 10–12-seeded.—A. Rich. Fl. Abyss. i. 213.

The commonly cultivated species, not clearly known anywhere in a native state.

4. **P. Mungo,** *Linn.; DC. Prod.* ii. 394. Stems a foot high, annual, suberect, clothed with deciduous spreading long yellowish hairs. Stipules ovate-lanceolate, 4–6 lines deep, attached below the centre. Petioles 2–4 in. long; leaflets 3, central one broad-ovate, 3–4 in. long, lateral ones unequal-sided, both sides subscabrous. Flowers 4–6 together on short axillary peduncles, with bracts like the stipules. Bracteoles linear, hairy, twice as long as the calyx, which is campanulate, $\frac{1}{8}$ in. deep, the teeth very short, subdeltoid, or the lowest lanceolate. Corolla yellowish, under half an inch deep. Pod linear, straight, terete, $1\frac{1}{2}$–2 in. long, 2–$2\frac{1}{2}$ lines broad, clothed with spreading tawny hairs, 10–15-seeded.

Nile Land. Throughout the Nile region, but perhaps cultivated only, *Kotschy! Speke and Grant!* &c.

Commonly cultivated in Tropical Asia.

5. **P. trinervius,** *Heyne; Wight et Arn. Prod.* 245. Stems annual or biennial, slender, climbing, clothed with deflexed grey or tawny hairs. Stipules ovate, striated, 4–6 lines deep, attached below the middle. Petioles 2–6 in. long, slender, hairy; leaflets 3, central broad-ovate or ovate-rhomboidal, 3–5 in. long, acute, lateral ones unequal-sided, upper surface glabrous, lower hairy on the veins. Flowers 3–6 close together on long or short slender flexuous peduncles. Bracts like the stipules. Pedicels very short, with a pair of ciliated lanceolate bracteoles at the apex, which exceed the calyx. Calyx campanulate, 2 lines deep, teeth deltoid, reaching a third down, two upper ones connate. Corolla rose-red, three or four times the calyx. Pod terete, 2–3 in. long, 2–$2\frac{1}{2}$ lines thick, silky, nearly straight, 10–12-seeded.—*P. opisotrichus*, Hochst. in Schimp. Hb. Abyss. No. 1718. *Vigna opisotricha*, A. Rich. Fl. Abyss. i. 220.

Nile Land. Abyssinia, *Schimper!*

Also a plant of Natal, the Comoro islands, and Tropical Asia. Very near the preceding, of which it is perhaps only the wild form.

6. **P. Kirkii,** *Baker.* Stems herbaceous, wide-twining, slender, slightly grey-silky when young. Stipules minute, not peltate. Petioles under an inch long, herbaceous, glabrous; leaflets 3, central one ovate, 1½ in. long, bluntish, lateral ones unequal-sided, both sides glabrous. Peduncles 1½–2 in. long, 2-flowered. Calyx campanulate, 2 lines deep, slightly hairy, the upper teeth short, deltoid, the lowest narrower, and reaching a quarter of the way down. Corolla rose-coloured, half an inch deep. Pod 4 in. long, ⅛ in. thick, terete, straight, glabrous.

Mozamb. Distr. West shore of Lake Nyassa, *Dr. Kirk!*

7. **P. trilobus,** *Ait.*; *DC. Prod.* ii. 394. Stems slender, herbaceous diffuse, subglabrous. Stipules ¼–½ in. long, lanceolate-oblong, subpeltate. Petioles 1–3 in. long, subglabrous; leaflets 3, central one deeply hastate, 1–2 in. each way, the middle square or spathulate, blunt or cuspidate, base broadly cuneate, lateral ones very unequal-sided, both sides subglabrous. Flowers 2–4 on peduncles 3–6 in. long. Bracts linear. Pedicels glabrous equalling the calyx, which is broadly campanulate, a line deep, the teeth very short, deltoid. Corolla reddish, half an inch deep. Pod terete, curved, 1–1½ in. long, ⅛ in. thick, 6–10-seeded, glabrous or slightly hairy.—Wight. Ic. t. 94.

Nile Land. Nubia, *Ehrenberg.* Abyssinia (*teste Schweinfurth*).
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Common in Tropical Asia.

64. **VIGNA,** Savi; Benth. et Hook. f. Gen. Plant. i. 539.

Calyx with the two upper teeth free or connate, the others equal or the lowest longer. Standard orbicular, the base appendiculate, with inflexed auricles; wings falcate-obovate, rather shorter than the standard; keel equalling the wings, truncate, or beaked at the tip, but the point not spiral. Upper stamen free, the others connate; anthers uniform. Ovary sessile, multiovulate; style filiform, dilated upwards, longitudinally bearded on the inner side upwards; stigma very oblique. Pod linear, straight or recurved, subterete, two-valved, filled within between the seeds.—Climbing herbs with pinnately trifoliolate leaves.

A genus widely dispersed through the warmer regions of both hemispheres, attaining its maximum with us.

* *Calyx-teeth lanceolate or linear, equalling or exceeding the tube.*

Stems from a shrubby base.
  Leaves glaucous green, glabrous on both sides . . . . . 1. *V. Burchellii.*
  Leaves grey-tomentose on both sides . . . . . 2. *V. frutescens.*
A suberect low annual . . . . . 3. *V. lancifolia.*
Herbaceous twiners.
  Upper pair of calyx-teeth connate.
    Leaves subglabrous . . . . . 4. *V. oblongifolia.*
    Leaves densely bristly on both sides . . . . . 5. *V. heterophylla.*
  Upper pair of calyx-teeth free.
    Peduncles 6–8-flowered . . . . . 6. *V. crinita.*
    Peduncles 2–4-flowered.
      Keel truncate at the point.
        Leaves fragile, membranous . . . . . 7. *V. membranacea.*
        Leaves tough, papyraceous or subcoriaceous.
          Petioles short (always under an inch).
            Peduncle with a few adpressed grey bristles . . 8. *V. andongensis.*

Peduncle densely clothed with deflexed silky bristles . . . . . 9. *V. radicans.*
Petioles elongated (1–3 in.) . . . . . 10. *V. reticulata.*
Keel with an elongated recurved beak.
Leaflets deeply lobed . . . . . 11. *V. lobatifolia.*
Leaflets not lobed.
Flowers yellow . . . . . 12. *V. golungensis.*
Flowers reddish-purple.
Stems and leaves clothed with silky bristles . . 13. *V. vexillata.*
Stem and leaves clothed with short grey pubescence 14. *V. phaseoloides.*

***Calyx-teeth rounded or deltoid, shorter than the tube.*

Stems clothed with conspicuous spreading silky hairs.
Leaflets deeply lobed . . . . . 15. *V. hastifolia.*
Leaflets entire.
Flowers solitary, very large . . . . . 16. *V. holosericea.*
Flowers several, small or middle-sized.
Leaflets lanceolate, the lateral ones not at all or very slightly unequal-sided.
Flowers 2–4-umbellate . . . . . 17. *V. parviflora.*
Flowers many in racemes.
Flowers all produced . . . . . 18. *V. pubigera.*
Many lower flowers aborted . . . . . 19. *V. ambacencis.*
Leaflets ovate, the lateral ones very unequal-sided.
Corolla 9–10 lines deep . . . . . 20. *V. Schimperi.*
Corolla $\frac{3}{8}$–$\frac{1}{2}$ inch deep.
Bracts exceeding buds . . . . . 21. *V. comosa.*
Bracts in bud not protruding.
Corolla blue . . . . . 22. *V. Donii.*
Corolla yellowish or reddish.
Calyx 1 line deep . . . . . 23. *V. Afzelii.*
Calyx 2 lines deep . . . . . 34. *V. luteola*, var. *villosa.*

Stems glabrous or subglabrous.
Leaflets shining subcoriaceous; style persistent, cuneately dilated at the point (*Sphenostylis*, E. Meyer).
Stems suberect . . . . . 24. *V. marginata.*
Stems wide twining . . . . . 25. *V. ornata.*
Leaflets coriaceous, lanceolate; style filiform . . . . . 26. *V. venulosa.*
Leaflets rarely coriaceous; style filiform deciduous.
Stipules comparatively large, persistent, distinctly spurred.
Corolla blue . . . . . 27. *V. cærulea.*
Corolla reddish or yellow.
Flowers 1–3 together, subsessile.
Keel shortly beaked . . . . . 28. *V. triloba.*
Keel with a long recurved beak . . . . . 29. *V. huillensis.*
Flowers up to 8–12 racemose, pedicellate.
Pod 2–3 inches long . . . . . 30. *V. nilotica.*
Pod 6–12 inches long . . . . . 31. *V. sinensis.*
Stipules small, evanescent, not spurred.
Leaflets ovate acute or subacute.
Calyx 1–1½ lines long.
Central leaflet ½–¾ in. broad . . . . . 32. *V. gracilis.*
Central leaflet 2–3 in. broad . . . . . 33. *V. multiflora.*
Calyx 2 lines long . . . . . 34. *V. luteola.*
Leaflets blunt.
End leaflet ovate-lanceolate . . . . . 35. *V. parvifolia.*
End leaflet oblong . . . . . 36. *V. oblonga.*
End leaflet roundish . . . . . 37. *V. lutea.*

1. **V. Burchelli,** *Harv. Fl. Cap.* ii. 239. Stems shrubby, suberect, copiously branched, slender, terete, glabrous. Stipules small, lanceolate, with a long spur. Petioles 2–3 lines, glabrous; leaflets 3, central one ovate-lanceolate, 1–2 in. long, the base rounded, apex narrowed gradually to a bluntish point, tipped with a rigid mucro; the petiolule $\frac{1}{4}$ in. long; lateral ones equal-sided; texture coriaceous, both sides glabrous, glaucous-green, the veinlets raised. Peduncles 2–3 in. long, firm, glabrous, bearing 3–6 flowers in an umbel at the apex. Bracts small, lanceolate, spurred. Pedicels $\frac{1}{4}$ in. long, bearing two small ovate spurred scarious bracteoles adpressed to the calyx, which is half an inch deep, the tube campanulate, the teeth four, the three upper ones lanceolate, reaching halfway down, the lowest longer, rigid and subpatent. Corolla rose-red, twice the calyx; standard $\frac{1}{2}$–$\frac{5}{8}$ in. broad; keel with an acute recurved beak. Pod unknown.—*Otopteris Burchellii*, DC. Prod. ii. 240.

South Central. In the interior, near the Tropic of Capricorn, *Chapman and Baines!* Kalaghari desert, near Lake Ngami, *Maccabe!*

A very distinct species, with the keel of a *Crotalaria*. Also a plant of the Cape.

2. **V. frutescens,** *A. Rich. Fl. Abyss.* i. 218. Root fusiform. Stem shrubby below, slender, twining, terete, pubescent upwards. Stipules ovate-lanceolate, tomentose. Leaflets ovate-oblong, slightly hastate, the lateral ones unequal-sided, and more deeply lobed on the lower side, clothed on both sides with grey tomentum. Peduncles exceeding the leaves, 1–4-flowered. Calyx campanulate, tomentose, with four lanceolate teeth equalling the tube. Corolla pale violet, standard glabrous. Young pods terete, very slender, silky.

Nile Land. Abyssinia, *Petit.*

Not seen.

3. **V. lancifolia,** *A. Rich. Fl. Abyss.* i. 221. Stems annual, suberect, under a foot high, slender, striated, slightly pilose. Stipules small, lanceolate acuminate. Petioles an inch long, subglabrous; leaflets 3, central one linear-lanceolate, 1–$1\frac{1}{2}$ in. long, 2 lines broad, narrowed gradually from near the base to the apex, the petiolule very short, lateral ones equal-sided, under surface thinly adpressed grey-silky. Flowers 2–4, on peduncles which exceed the petioles. Bracts small, linear. Pedicels a line long; bracteoles blunt and very minute. Calyx campanulate, 2 lines deep, subglabrous, the teeth lanceolate, reaching half down, the upper two connate. Corolla rose-red, more than twice as long as the calyx; keel truncate. Pod terete, $1\frac{1}{2}$ in. long, 2 lines thick, densely ferruginous-bristly, 6–8-seeded.

Nile Land. Abyssinia, *Quartin-Dillon!*

4. **V. oblongifolia,** *A. Rich. Fl. Abyss.* i. 220. Stems herbaceous, slender, wide-twining, slightly tawny-bristly. Stipules minute, ovate acuminate. Petioles $1\frac{1}{2}$–2 in. long, slender, thinly bristly; leaflets 3, the central one ovate-lanceolate, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, the upper half narrowed gradually to a point with a mucro; petiolule 4 lines long; lateral ones slightly unequal-sided, upper surface glabrous, lower thinly-bristly when young. Flowers 2–4 on densely bristly peduncles about

an inch long. Calyx campanulate, glabrous, 2 lines deep, the two upper teeth connate, deltoid, the three others lanceolate acuminate, reaching quite halfway down. Corolla rose-red, twice as deep as the calyx; keel truncate. Pod $1\frac{1}{2}$ in. long, under $\frac{1}{4}$ in. thick, subterete, hispid.

Nile Land. Abyssinia, *Quartin-Dillon!*

5. **V. heterophylla,** *A. Rich. Fl. Abyss.* i. 218. Stems herbaceous, twining, densely clothed with deflexed bristly ferruginous hairs. Stipules small, ovate. Petioles 2–3 in. long, densely clothed like the stem; leaflets 3, the central one ovate, 2–3 in. long, subacute, mucronate, petiolule $\frac{1}{2}$ in. long, lateral ones slightly unequal-sided, both sides scabrous with short grey or ferruginous hairs. Peduncles 2–3 in. long, densely silky, 3–5-flowered. Pedicels very short; bracteoles setaceous, shorter than the calyx, which is $\frac{1}{4}$ in. deep, densely ferruginous-silky; teeth lanceolate, reaching halfway down, the two upper ones connate. Corolla red, twice the calyx; standard densely silky on the outside; keel truncate. Pod linear, densely ferruginous-silky, not seen mature.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon!*

6. **V. crinita,** *A. Rich. Fl. Abyss.* i. 217. Stems herbaceous, moderately robust, wide-climbing, densely clothed with deflexed bright-ferruginous bristly hairs. Stipules 3–4 lines long, lanceolate-acuminate. Petioles 4–6 in. long, densely clothed like the branches; leaflets 3, central one ovate, 3–5 in. long, apex acuminate; petiolule $\frac{1}{2}$–$\frac{3}{4}$ in. long; lateral ones unequal-sided, both sides thinly coated with adpressed bristly hairs. Peduncles exceeding the leaves, 7–8-flowered. Calyx subsessile, densely ferruginous-bristly, the teeth linear. Corolla violet-purple, three times as long as the calyx. Pods 2 in. long, linear, densely ferruginous-bristly.

Nile Land. Abyssinia, *Quartin-Dillon!*

7. **V. membranacea,** *A. Rich. Fl. Abyss.* i. 219. Stems very slender, herbaceous, wide-climbing, thinly clothed with long spreading grey-silky hairs. Stipules 3–4 lines, lanceolate. Petioles $1\frac{1}{2}$–2 in. long, very slender, clothed like the branches; leaflets 3, membranous, ovate-rhomboidal, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, acuminate or cuspidate, the base rounded or broad-cuneate; petiolule $\frac{1}{4}$–$\frac{1}{2}$ in. long; lateral ones unequal-sided, both sides slightly hairy. Flowers 2–4 on very slender flexuose peduncles 1–2 in. long, pedicels 1 line long. Calyx $\frac{3}{8}$ in. deep, the teeth linear, setaceous, ciliated, equal and reaching two-thirds of the way down. Corolla rose, half as long again as the calyx; keel truncate. Pod linear, straight, subterete, 2–$2\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, finally glabrous, 10–12-seeded. — *Phaseolus microspermus,* Hochst. in Schimp. Hb. Abyss. No. 1439.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!* Nubia, *Ehrenberg* (*fide Schweinfurth*).

8. **V. andongensis,** *Baker.* Rootstock fusiform. Stems herbaceous, wide-trailing, clothed densely with spreading silky hairs. Stipules

lanceolate acuminate, $\frac{1}{4}$–$\frac{5}{8}$ in. Petioles $\frac{1}{2}$–1 in., densely pubescent; leaflets 3, subcoriaceous, persistently clothed on both sides with adpressed grey silky hairs; end one oblong 2–3 in. long, blunt or subacute; petiolule $\frac{3}{8}$–$\frac{1}{2}$ in.; lateral ones unequal-sided. Peduncles 2–3 in. long, clothed with adpressed silky hairs, 2–3-flowered. Calyx $\frac{1}{2}$–$\frac{5}{8}$ in. densely adpressed grey-silky; teeth 5, linear-setaceous, plumose, reaching three-quarters down. Corolla reddish, $\frac{7}{8}$ in.; standard 1 in. broad; keel not rostrate. Ovary linear, densely silky, multiovulate. Pod unknown.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

Closely allied to this is *V. Kotschyi*, Schweinf. Rel. Kots. 29, t. 22, from Nubia, of which the leaves are not known. It has a densely grey-tomentose stem, flowers 2–3 together on long or short peduncles from leafless branches, calyx $\frac{1}{2}$ in. long, with five subequal lanceolate teeth as long as the tube, a pair of small linear bracteoles at the base, and a reddish corolla an inch deep, with an unbeaked keel.

9. **V. radicans,** *Welw. mss.* Rootstock slender, fusiform. Stems slender, herbaceous, wide-trailing, rooting at the nodes, clothed with fine spreading silky hairs. Stipules minute, ovate-lanceolate. Petioles 2–3 lines; leaflets 3, papyraceous, bright-green, clothed equally with adpressed grey bristles on both sides; end one oblong subacute 2–$2\frac{1}{2}$ in.; petiolule $\frac{1}{4}$–$\frac{1}{2}$ in.; lateral ones smaller, nearly equal-sided. Flowers 1–4 close together on slender ascending peduncles 2–4 in. long, clothed especially in the upper half with reflexed black silky hairs. Calyx $\frac{3}{8}$ in., subsessile, clothed with similar hairs mixed with grey ones; teeth 5, linear-setaceous, twice the tube. Corolla deep violet-purple, $\frac{5}{8}$ in.; standard and point of keel not at all recurved. Pod linear, clothed with black silky hairs, 7–8-seeded, slightly recurved, only seen immature.

Lower Guinea. Highlands of Huilla, social in damp pastures, *Dr. Welwitsch!*

10. **V. reticulata,** *Hook. f. Fl. Nigr.* 310. Stems herbaceous, wide-climbing, clothed with conspicuous spreading grey or brownish silky hairs. Stipules $\frac{1}{4}$–$\frac{3}{8}$ in., lanceolate-peltate. Petioles 1–3 in.; leaflets 3, papyraceous, persistent, clothed with adpressed grey hairs on both sides, the veinlets beneath raised; end one lanceolate, reaching 5–6 in. long, acute; petiolule $\frac{1}{2}$–$\frac{3}{4}$ in.; lateral ones similar, scarcely unequal-sided. Flowers 2–4 close together on peduncles 2–4 in. long. Calyx $\frac{5}{8}$–$\frac{3}{4}$ in., clothed with adpressed grey-silky hairs; teeth 5, equal, linear-setaceous, reaching three-quarters of the way down. Corolla reddish, equalling or slightly exceeding the calyx; the keel not rostrate at the point. Pod linear, straight, terete, $2\frac{1}{2}$–3 in. long, black when mature, densely clothed with shining dark-brown velvety bristles when young; seeds 10–12.

Upper Guinea. Niger land, *Vogel! Barter!*
Lower Guinea. Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*

Var. β. *V. linearifolia,* Hook. f. Fl. Nigr. 309. Leaflets linear, the end one 6–7 in. long, $\frac{3}{4}$–$\frac{1}{2}$ in. broad, narrowed gradually from near the base to an acute point.

Upper Guinea. Niger country, *Dr. Vogel!*

11. **V. lobatifolia,** *Baker.* Stems firm-herbaceous, clothed with short ferruginous tomentum. Stipules small, lanceolate, striated. Petioles about an inch long; leaflets 3, subcoriaceous, the central one hastate, 2–3 in. long, 1–1½ in. broad, the lobes rounded, reaching halfway down to the midrib, apex bluntish with a mucro; petiolule ¼ in. long; lateral ones unequal-sided and deeply-lobed, both sides with a little short down and the veinlets raised. Peduncles 2–4 in. long, 2–3-flowered. Calyx finely downy, ½ in. deep, the five equal linear-lanceolate teeth reaching more than halfway down. Corolla rose-red, half as long again as the calyx; standard ¾ in. broad, veined, the keel with a long recurved beak. Young pod linear, terete, densely brown-silky.

South Central. Between Koobie and N. Shaw valley in the interior near the Tropic of Capricorn, *Baines!*

This has flowers like those of *V. vexillata*, and leaves in shape and texture like the Cape *V. decipiens*.

12. **V. golungensis,** *Baker.* Stems herbaceous, trailing, clothed copiously with long spreading deflexed brown hairs. Stipules linear, ¼–⅜ in. Petioles 1–3 in.; leaflets 3, papyraceous with raised veins below, thinly clothed with adpressed grey bristly hairs on both sides; end one ovate acute 2–2½ in. long; petiolule 6–9 lines; lateral ones very unequal-sided. Peduncles 6–9 in., subglabrous, 2–4-flowered. Calyx subsessile, ⅜ in., subglabrous; teeth lanceolate as long as tube. Corolla yellow, ¾ in.; keel rostrate, its point and standard recurved. Pod unknown.

Lower Guinea. Golungo Alto, in woods, *Dr. Welwitsch!*

May be a variety of *V. vexillata*, near *Thonningii*.

13. **V. vexillata,** *Benth. in Mart. Fl. Bras.* xxiv. 194, t. 50, fig. 1. Root-stock large, fusiform. Stems herbaceous, wide-climbing, clothed with spreading silky hairs. Stipules lanceolate, 3–4 lines. Petioles 1–3 in., with copious spreading hairs; leaflets 3, papyraceous, dark green with adpressed strong silky hairs on both sides, the veinlets below raised; end one lanceolate or ovate-lanceolate acute, 4–6 in. long; petiolule ½–¾ in.; lateral ones very unequal-sided. Peduncles 3–12 in. long, 2–4-flowered. Calyx subsessile, ½–⅝ in., silky; teeth linear-lanceolate as long as tube. Corolla reddish-purple, 1 in. long conspicuously veined; keel prolonged into an incurved beak. Pod linear, 3–4 in. long, silky, recurved.—*Phaseolus vexillatus*, Linn. Sp. Plant. 1017. *Plectrotropis hirsuta*, Schum. et Thonn. Pl. Guin. 338. *Strophostylis capensis*, E. Meyer, Comm. 147. *Phaseolus quadrifarius*, Hochst. in Schimp. Hb. Abyss. No. 1426. *Vigna tuberosa*, A. Rich. Fl. Abyss. i. 217, t. 42 (leaflets broader; calyx teeth linear-setaceous).

Upper Guinea. Senegambia, *Leprieur.* Sierra Leone, *Afzelius!* Gold Coast, *Barter!*

Nile Land. Abyssinia, *Schimper!* and others.

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

A very variable plant, reaching Natal, and widely-dispersed through Tropical

America. By the recurved point of the keel, spp. 11–14 recede from typical *Vigna* in the direction of *Phaseolus*. A plant from Zambesi land, gathered by Dr. Kirk, with more coriaceous leaves and more densely hispid leaflets, calyx and pod, is perhaps distinct.

Var. β. *V. Thonningii*, Hook. f. Fl. Nigr. 311. Stem trailing. Petioles ¾–1½ in. Leaflets broader and shorter, the end one ovate or obovate, 2–3 in. long. Calyx less hairy, less than half as long as the corolla.

Upper Guinea. Cape Coast and Fernando Po, *Vogel!*

A trailing coast form.

Lower Guinea. Mossamedes, *Dr. Welwitsch!*

Var. γ. *V. angustifolia*, Hook. Fl. Nigr. loc. cit. Whole plant subglabrous; leaflets lanceolate, much smaller; the end one 2–3 in. long, ¼–½ in. broad; flowers smaller; calyx subglabrous.

Upper Guinea. Guinea proper, *Thonning, Barter!*

14. **V. phaseoloides,** *Baker.* Stems slender herbaceous wide-climbing clothed with soft short pubescence. Petioles short; leaflets 3, subscabrous above with inconspicuous bristles, pale green and finely downy all over below; end one obovate acute 3–3½ in. long; lateral ones very unequal-sided. Flowers 2–4, subsessile on the apex of a downy peduncle 1–4 in. long. Calyx ⅜ in., finely downy; teeth lanceolate acuminate as long as the tube. Corolla 1 in., reddish-purple, veined; keel with a long recurved beak. Pod linear, 4–4½ in. long, nearly straight, finely downy.

Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*

Differs from *V. vexillata* principally in the texture of the leaves and nature of the pubescence.

15. **V. hastifolia,** *Baker.* Stem firm-herbaceous, twining, permanently clothed with fine short white pubescence. Stipules minute, lanceolate, silky. Petioles firm, 1–3 in. long. Leaflets 3, the central one hastate, bluntly lobed halfway down from the edge to the midrib, the point blunt, the base subcuneate, its petiolule 4–12 lines long, the lateral ones usually similarly lobed on the lower side only, texture subcoriaceous, the upper side thinly and the lower densely clothed with adpressed white cottony hairs. Flowers (always ?) solitary on lateral pedicels 3–4 lines long. Calyx campanulate, 4 lines deep, densely silky, the blunt subdeltoid lobes not reaching half down. Flowers pale yellow, turning yellow as they fade, very fragrant, 8–9 lines deep, and standard 8–9 lines broad. Pod linear, flattened, 4–5 in. long, 3–4 lines broad, persistently clothed with adpressed white-silky hairs, 12–15-seeded.

Upper Guinea. Nupe, and Jeba, *Barter!*

This may be *Dolichos argenteus*, Willd., DC., Prod. ii. 399, a Guinea plant which we are not able to identify more certainly.

16. **V. holosericea,** *Welw. mss.* Stems wide-twining, densely clothed with soft spreading whitish tomentum. Stipules minute lanceolate not spurred. Petioles 1–2 in., densely pubescent; leaflets 3, rather thick, soft, matted especially below with grey tomentum; end one oblong-rhomboidal, 2–3 in. long, rounded at the base, blunt with a mucro; petiolule 3–4 lines; lateral ones unequal-sided. Flowers solitary on densely pubescent peduncles ½–2½ in. long. Calyx ½ in., densely

silky, with a pair of large round bracteoles at the base; teeth deltoid, rather shorter than tube. Corolla rose-purple, 18–21 lines deep, much the largest of all the species; standard $1\frac{1}{4}$ in. broad; keel blunt. Pod 3–4 in. long, slightly recurved, densely velvety, not seen mature; persistent style flattened at the point.

Lower Guinea. Golungo Alto, *Dr. Welwitsch!*

17. **V. parviflora,** *Welw. mss.* Stem slender, herbaceous, twining, thinly clothed with deflexed bristly grey hairs. Stipules minute lanceolate. Petioles $\frac{1}{2}$–1 in.; leaflets 3, lanceolate, subacute, with a few adpressed grey hairs on both sides; end one $1\frac{1}{2}$–2 in. long, rounded at the base; petiolule 3–4 lines; lateral ones not unequal-sided. Flowers 2–4 in an umbel at the tip of a slender, slightly hispid peduncle 2–3 in. long. Pedicels 1 line. Calyx 1 line, campanulate, slightly bristly; teeth deltoid as long as tube, lowest lanceolate. Corolla greenish, $\frac{1}{4}$ in. Pod linear with a few adpressed bristles, not seen mature.

Lower Guinea. Mossamedes, Benguela, in sandy soil, *Dr. Welwitsch!*

18. **V. pubigera,** *Baker.* Stems herbaceous, wide-climbing, densely clothed with soft deflexed pubescence. Stipules minute, linear-subulate. Petiole $1\frac{1}{2}$–2 in. long, clothed like the stem; leaflets 3, papyraceous, the central one lanceolate, 3–5 in. long, acute, the base rounded, the petiolule $\frac{1}{2}$–$\frac{3}{4}$ in. long, the lateral ones rather unequal-sided, both surfaces finely pubescent all over, the veinlets raised. Flowers 6–12 in capitate racemes on densely ferruginous-pubescent peduncles 2–3 in. long. Bracteoles small, setaceous. Pedicels silky, a line long. Calyx campanulate, silky, $\frac{1}{8}$ in. deep, the teeth deltoid. Corolla $\frac{1}{2}$–$\frac{5}{8}$ in. deep, yellowish, the keel recurved at the point. Ovary linear, silky. Pod unknown.

Upper Guinea. Nupe, *Barter!*

19. **V. ambacensis,** *Welw. mss.* Stems firm, slender, very twining, clothed with short spreading grey pubescence. Stipules very minute. Petioles 1–2 in., pubescent; leaflets 3, papyraceous, with a few adpressed hairs on both sides, veins beneath raised; end one lanceolate, 2–3 in. long, blunt, mucronate; petiolule $\frac{1}{4}$–$\frac{1}{2}$ in.; side ones deflexed, rather unequal-sided. Racemes solitary or in pairs, sessile or shortly peduncled from the axils of the leaves, and the leafless upper part of the branches, many lower nodes abortive, 4–6 top flowers only developed. Pedicels very short. Calyx $\frac{1}{8}$ in., campanulate, inconspicuously downy; teeth deltoid, very short. Flowers violet-purple, 5–6 lines; standard silky on the back.

Lower Guinea. Highlands of Ambaca, *Dr. Welwitsch!*

20. **V. Schimperi,** *Baker.* Stems moderately stout, twining very much, densely clothed with yellowish-brown silky pubescence. Stipules linear, silky, $1\frac{1}{2}$–2 lines long. Petioles 6–12 lines long; leaflets ovate, acute, subcoriaceous, $1\frac{1}{2}$–2 in. long, at first inconspicuously silky on both sides. Flowers about 6 in an umbel on silky peduncles $\frac{1}{2}$–5 in.

long. Pedicels silky, 1–1½ lines long. Calyx 3–3½ lines deep, silky, the upper teeth deltoid, equal to the campanulate tube, the lower lanceolate, distinctly longer. Flowers yellow, 9–10 lines deep, the glabrous standard 7–8 lines broad. Immature pod linear, more than 2 in. long, densely silky, 12–15-seeded.

Nile Land. Abyssinia, *Schimper!*

21. **V. comosa,** *Baker.* Stems slender, wide-twining, clothed with fine spreading grey hairs. Stipules linear, very minute. Petioles downy, 1–2 in.; leaflets 3, papyraceous, finely downy on both sides, end one ovate, 15–18 lines long, acute, rounded at the base; petiolule 3–4 lines; lateral ones unequal-sided. Flowers in close racemes 12–15 lines long, on straight downy peduncles 6–10 in. long, the setaceous bracts exceeding the buds. Pedicels very short. Calyx 1 line long; teeth deltoid, lowest lanceolate. Corolla yellow, ⅜ in.; standard glabrous on the back. Pod linear, finely downy, not seen mature.

Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*

22. **V. Donii,** *Baker.* Stems slender, herbaceous, wide-twining, densely clothed when young with fine deflexed tawny silky hairs. Stipules 2 lines deep, auricled. Petioles an inch long, clothed like the stems; leaflets 3, membranous, terminal one ovate, 1½–2 in. long, subacute, lateral ones very unequal-sided, both sides finely-silky. Flowers 6–12 in flexuose rather lax racemes on silky peduncles about equalling them. Pedicel equalling the calyx, which is campanulate, ⅛ in. deep, subglabrous, the teeth reaching about halfway down. Corolla blue, 4–5 lines deep. Pod linear, 1–1¼ in. long, ⅛ in. broad, straight, glabrous.—*Clitoria racemosa*, G. Don, Gard. Dict. ii. 215.

Upper Guinea. Island of St. Thomas, *G. Don!*

23. **V. Afzelii,** *Baker.* Stems very slender, wide-climbing, clothed with fine grey pubescence. Stipules linear, very minute. Petiole 9–18 lines long, pubescent like the branches; leaflets 3, the central one ovate, 12–18 lines long, 5–7 lines broad, bluntish, the base deltoid, the side ones shorter, unequal-sided, texture membranous, under surface at first finely grey-downy. Peduncles 1½–5 in. long. Racemes dense, 3–12-flowered. Pedicels silky, 1–2 lines long. Calyx broadly campanulate, a line deep, nearly glabrous, the deltoid teeth reaching nearly halfway down. Corolla reddish, half an inch, the standard half an inch broad. Pod linear, 6–8 lines long, a line broad, glabrous when mature, 5–6-seeded.

Upper Guinea. Sierra Leone, *Afzelius!*

24. **V. marginata,** *Benth. in Harv. Fl. Cap.* ii. 240. Stem woody, suberect, the young branches subglabrous. Stipules minute, linear. Petiole 12–18 lines long, firm, glabrous; leaflets 3, chartaceous, quite glabrous, the central one oblong, 2–2½ in. long, acute or blunt, rounded at the base, with a petiolule 5–6 lines long, lateral ones slightly unequal-sided. Flowers 4–6 crowded at the summit of firm

peduncles 2–10 in. long. Pedicels a line to $\frac{1}{8}$ in. long. Calyx 2 lines deep, broadly campanulate, with a pair of small oblong bracteoles clasping it, the lobes bluntly rounded, not reaching more than a third of the way down. Corolla reddish, 8–9 lines deep; standard $\frac{1}{2}$ in. broad, emarginate, the keel falcate. Pod linear, $2\frac{1}{2}$–3 in. long, tipped with the upcurved style, which is dilated and flattened at the apex.—*Sphenostylis marginata*, E. Meyer, Comm. 148.

Mozamb. Distr. Zambesi land, *Dr. Kirk! Waller!*
Also a plant of Natal.

25. **V. ornata,** *Welw. mss.* Stems wide-climbing, moderately stout, quite glabrous. Stipules small, lanceolate. Petioles 6–18 lines long; leaflets 3, oblong-lanceolate lanceolate or linear, the terminal one 2–$4\frac{1}{2}$ in. long, narrowed from the middle to an acute point, the base rounded, lateral ones unequal-sided, subcoriaceous, veins immersed, both sides quite glabrous, rather shiny. Peduncles stout, $\frac{1}{2}$–3 in. long. Racemes 2–10-flowered, rather lax. Pedicels glabrous, lower ones 1–2 lines long. Calyx broadly campanulate, glabrous, $2\frac{1}{2}$ lines deep, the blunt semicircular teeth reaching $\frac{1}{3}$–$\frac{1}{4}$ of the way down. Corolla large, an inch deep, showy, red, the deeply emarginate standard a line broad. Pod linear, 4–5 in. long, glabrous, not seen mature. Style persistent, flattened.

Lower Guinea. Golungo Alto, Angola, the handsomest of all the genus. *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*

26. **V. venulosa,** *Baker.* Stems very slender, wide-climbing, glabrous. Stipules very minute, linear, scarious. Petioles very slender, 6–9 lines long; leaflets 3, ligulate, subequal, 12–21 lines long, 2–4 lines broad, blunt with a mucro, the base rounded, texture rigidly coriaceous, both sides bright green with the veins remarkably raised. Peduncle 12–18 lines long, 2–4-flowered. Pedicels very short. Calyx a line deep, broadly campanulate, glabrous, the deltoid teeth reaching a third of the way down. Corolla reddish, $\frac{3}{8}$ in. long. Immature pod linear.

Upper Guinea. Sierra Leone, *Afzelius!*

27. **V. cœrulea,** *Baker.* Stems wide-climbing, slender, herbaceous, glabrous. Stipules broad-lanceolate, 2 lines deep, glabrous, striated. Petioles an inch long, glabrous. Leaflets 3, the central one ovate or slightly hastate, 1–$1\frac{1}{2}$ in. long, about half as broad, blunt or subacute, base rounded or subcuneate; petiolule half an inch long; lateral ones unequal-sided, both sides glabrous. Flowers in pairs on glabrous peduncles 4–6 in. long. Pedicels very short. Calyx campanulate, glabrous, $\frac{1}{8}$ in. deep; teeth deltoid, reaching a quarter down. Corolla blue, more than half an inch deep. Pod linear, terete, 3 in. long, $\frac{1}{4}$ in. thick, glabrous, slightly recurved, finally black, 10–12-seeded.

Mozamb. Distr. Zambesi land, at the mouth of the river near Luabo, *Dr. Kirk!*

28. **V. triloba,** *Walp.; Harv. Fl. Cap.* ii. 221. Stems slender, wide-twining glabrous. Stipules lanceolate, $\frac{1}{4}$ in., persistent, distinctly spurred. Petioles 1–3 in., slender; leaflets 3, glabrous, papyraceous, acute, end one ovate-rhomboidal or hastate with short bluntly rounded lateral lobes, 2–3 in. long; petiolule $\frac{1}{2}$ in.; lateral ones unequal-sided, sometimes shortly lobed on the lower side. Flowers 1–2, subsessile at the top of glabrous spreading peduncles 1–4 in. long. Calyx 2 lines, campanulate; teeth deltoid, shorter than the tube. Corolla bright red, $\frac{3}{4}$–$\frac{7}{8}$ in. long; keel shortly beaked. Pod linear, terete, 3–$3\frac{1}{2}$ in. long, glabrous, recurved.

Lower Guinea. Loanda and Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Between Tette and the sea coast, *Dr. Kirk.*
Also a plant of the Cape.

29. **V. huillensis,** *Welw. mss.* Stems wide-twining slender glabrous. Stipules deltoid, $\frac{1}{4}$ in. persistent, distinctly spurred. Petioles $\frac{3}{4}$–1 in.; leaflets 3, acute, subcoriaceous, glabrous with raised veinlets on both sides; end one linear lanceolate or ovate-rhomboidal, 2–3 in. long; petiolule 3–4 lines; lateral ones often unequal-sided. Flowers 1–3 sessile at the point of flexuose glabrous peduncles 1–$1\frac{1}{2}$ in. long. Calyx $\frac{3}{8}$ in., glabrous, rugose-plicate, clasped by a pair of subpersistent round bracteoles at the base; teeth deltoid shorter than the tube. Corolla light rose-violet above an inch deep; keel with a prolonged recurved beak. Pod linear glabrous nearly straight, not seen mature.

Lower Guinea. Highlands of Huilla, 4000–5000 feet, *Dr. Welwitsch!*

30. **V. nilotica,** *Hook. f. Fl. Nigr.* 311. Stems twining, subglabrous. Stipules lanceolate, 3–4 lines long. Petioles 1–2 in. long, glabrous; leaflets 3, central one ovate-rhomboidal or slightly hastate, 2–3 in. long, pointed, the base broad-cuneate; petiolule $\frac{1}{4}$–$\frac{3}{8}$ in. long; lateral ones unequal-sided, both sides glabrous. Flowers 4–8 in close racemes on peduncles 3–5 in. long. Bracteoles small blunt. Pedicel very short, glabrous. Calyx campanulate, glabrous, $\frac{1}{4}$ in. deep; teeth deltoid, reaching a third down, the two upper ones connate. Corolla yellowish-green, $\frac{5}{8}$–$\frac{3}{4}$ in. deep. Pods 2–3 in. long, $\frac{1}{4}$ in. broad, pendulous, sub-compressed, slightly curved, glabrous, slightly torulose, 6–8-seeded.—*Dolichos niloticus*, Delile, DC. Prod. ii. 399. *D. sinensis*, Forsk. not Linn.

Upper Guinea. Senegambia, *Perrottet.*
Nile Land. Nubia, *Kotschy! Petherick!* Abyssinia, *Schimper!* Banks of the Mgeta, 7° S. lat., 38° E. long., *Speke and Grant!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Known principally or entirely under cultivation, and very doubtfully distinct from *V. luteola.*

31. **V. sinensis,** *Endl.; Hassk. Pl. Rar. Jav.* 386. Stems annual, twining, subglabrous. Stipules ovate-lanceolate, subpeltate, 4–6 lines deep. Petioles 2–6 in. long, glabrous; leaflets 3, central one roundish or ovate, 3–6 in. long, acute, the base rounded; petiolule 1–2 in. long, lateral ones often unequal-sided, both sides glabrous. Flowers in 6–12-

flowered racemes on glabrous peduncles 6–12 in. long. Bracts like the stipules. Pedicels very short. Calyx glabrous, 2 lines deep; teeth deltoid acuminate, shorter than the tube, the two upper ones connate. Corolla yellow or reddish, an inch deep. Pods pendulous, glabrous, 6–12 in. long, $\frac{3}{8}$ in. broad, subcompressed, 10–15-seeded, slightly torulose when fully matured, with a thick decurved beak. Seeds white, red or black.—*Dolichos sinensis*, Linn., DC. Prod. ii. 399. *D. Catiang*, Linn. Mant. 259. DC. Prod. l.c. *V. Catiang*, A. Rich. Fl. Abyss. i. 219. *D. unguiculatus*, Linn., DC. Prod. ii. 400. Guill. et Perr. Fl. Seneg. 218. *D. oleraceus*, Schum. et Thonn. Pl. Guin. 340. *D. melanopthalmus*, DC. Prod. l.c.

Upper Guinea. Senegambia, *Perrottet!* Guinea proper, *Thonning, Vogel! Barter!* Fernando Po, *Mann*, 415!

Nile Land. Nubia, *Kotschy! Schweinfurth!* Abyssinia, *Schimper, Quartin-Dillon and Petit!* Local name Adouggouari.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

Universally cultivated throughout the Tropics. The pods are eaten, and the fibres of the long peduncles are used for ropes, nets, and cloth.—*D. tranquebaricus*, Jacq., is a variety with spreading pods and ovate-rhomboidal or slightly hastate leaves.

32. **V. gracilis,** *Hook. f. Fl. Nigr.* 311. Stems herbaceous, very slender, wide-twining, slightly pubescent. Stipules minute, lanceolate, deciduous. Petioles 1–$1\frac{1}{2}$ in. long, very slender; leaflets 3; central one broad-ovate or ovate-rhomboidal, 1–$1\frac{1}{2}$ in. long, bluntish or subacute, petiolule $\frac{1}{4}$ in. long, lateral ones similar, unequal-sided, membranous, both sides glabrous. Flowers 6–10 in short racemes on slender glabrous flexuose peduncles 3–4 in. long. Calyx campanulate, glabrous, a line deep, teeth deltoid, reaching a third down. Corolla rose, 3–4 times the calyx. Pods pendulous, linear, subterete, an inch long, $\frac{1}{8}$ in. broad, nearly straight, 6–8-seeded.—*Dolichos gracilis*, Guill. et Perr. Fl. Seneg. 219.

Upper Guinea. Senegambia, *Heudelot! Leprieur and Perrottet!*

33. **V. multiflora,** *Hook. f. Fl. Nigr.* 308. Stems wide-climbing, herbaceous, very slender, with a few spreading grey-silky hairs when young. Stipules 1–2 lines long, lanceolate. Petioles 2–3 in. long, very slender; leaflets 3, broad-ovate, 2–3 in. long, acute, petiolule $\frac{1}{4}$–$\frac{3}{8}$ in. long; lateral ones similar, slightly unequal-sided, membranous, both sides subglabrous. Flowers 6–12 in short racemes on slender glabrous peduncles 3–4 in. long. Bracts and bracteoles minute, setaceous. Calyx campanulate, glabrous, $\frac{1}{8}$ in. deep, teeth deltoid, reaching a third down. Corolla rose, 3 or 4 times the calyx. Pod linear, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, pendulous, subterete, glabrous, 6–8-seeded.

Upper Guinea. Fernando Po, *Vogel!*

34. **V. luteola,** *Benth. in Mart. Fl. Bras.* xxiv. 194, t. 50, fig. 2. Stems very slender wide-twining glabrous. Petiole 1–2 in. Stipules minute lanceolate not spurred. Leaflets 3, membranous, both sides glabrous; end one ovate, acute, 2–3 in. long; petiolule 4–6 lines; lateral ones unequal-

sided. Flowers up to 12–20 in a conical raceme on a glabrous peduncle 2–4 in. long. Pedicels 1 line. Bracts and bracteoles very minute. Calyx campanulate glabrous 2 lines; teeth deltoid shorter than the tube. Corolla yellowish 5–6 lines long; standard glabrous on the back. Pod linear, 1½–2 in. long, slightly recurved, glabrescent or thinly silky.—Harv. Fl. Cap. ii. 241. *V. glabra*, Savi; DC. Prod. ii. 401. *Scytalis helicopus*, E. Meyer, Comm. 146.

Upper Guinea. Gold Coast, *Vogel!* Old Calabar, *Mann!*
Nile Land. Nubia, *Kotschy!* (Leaflets lanceolate.)
Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

Var. β. *V. villosa*, Savi, DC. Prod. ii. 401. Stems, petioles, peduncles, and sometimes leaves more or less densely clothed with spreading silky hairs. Flowers often reddish; *V. nigritia*, Hook. f. Fl. Nigr. 310 (leaflets lanceolate).
Upper Guinea. Senegambia, *Ingram!* Niger country, *Vogel! Barter!* and others.
Lower Guinea. Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zanzibar, *Dr. Kirk!*
Also a plant of the Cape, and of Tropical Asia and America.

35. **V. parvifolia,** *Planch. in Herb. Mus. Brit.* Stems wide-climbing, very slender, finely villous when young. Stipules minute, setaceous. Petioles slender, ½–¾ in. long; leaflets 3, central one ovate-lanceolate, an inch long, blunt; lateral ones unequal-sided, membranous, both sides glabrous when mature. Flowers 6–8 in lax flexuose racemes on slender peduncles 1–1½ in. long. Pedicel equalling the campanulate calyx, which is a line deep, teeth deltoid, not reaching more than a quarter down. Corolla pale-reddish, ¼ in. deep. Pod ⅝–¾ in. long, ⅛ in. thick, linear, straight, glabrous, about 6-seeded.

Upper Guinea. Sierra Leone, *Afzelius!*

36. **V. oblonga,** *Benth. Bot. Sulph.* 86. Stems slender, glabrous, prostrate or twining. Stipules minute, evanescent. Petioles 1–1½ in. long, slender, glabrous; leaflets 3, central one ovate-oblong, 1½–2 in. long, blunt, base subcuneate; petiolule half an inch long, both sides quite glabrous. Flowers 4–12 on glabrous peduncles considerably exceeding the leaves. Pedicels a line long, glabrous. Calyx campanulate, 2 lines deep, the two upper teeth short, subconnate, the others deltoid, reaching a third of the way down. Corolla yellow, ½–⅝ in. deep. Pods subpendulous, 2–2½ in. long, ¼ in. broad, slightly curved, glabrous, subcompressed, slightly torulose.—Fl. Nigr. 308.

Upper Guinea. Guinea and Fernando Po, on the coast, *Vogel! Barter!*
Known also in Tropical America, but very doubtfully distinct from *V. luteola.*

37. **V. lutea,** *A. Gray, Bot. Amer. Expl. Exped.* i. 454. Stems herbaceous, robust, procumbent or twining, subglabrous. Stipules minute, lanceolate. Petioles firm, 1–3 in. long; leaflets 3, rather fleshy, central one roundish or broad-obovate, 2–3 in. each way, blunt, the base broadly rounded; petiolule under half an inch; the lateral ones similar. Flowers 4–8, on firm glabrous peduncles 2–4 in. long. Pedicels

a line long, glabrous. Calyx campanulate, glabrous, $\frac{1}{8}$ in. deep; teeth very short, subdeltoid, the upper ones connate. Corolla yellowish-green, half an inch deep. Pod 2–3 in. long, curved, glabrous, subterete, $\frac{1}{4}$ in. thick, slightly torulose when mature, 4–6-seeded.—*Scytalis anomala*, Vogel in Nov. Act. Acad. Cæs. Leop. 19, suppl. i. 32. *V. anomala*, Walp. Rep. i. 779. *V. retusa*, Walp. Rep. i. 778. Harv. Fl. Cap. ii. 242. *Scytalis retusa*, E. Meyer, Comm. 147.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Also a plant of Tropical Asia, Australia, Polynesia, America, and the Cape.

65. **VOANDZEIA**, Thouars; Benth. et Hook. f. Gen. Plant. i. 539.

Calyx minute, campanulate, with five subequal teeth reaching halfway down. Standard obovate, the base appendiculate, with small inflexed auricles; wings oblanceolate, as long as the standard; keel boatshaped, not rostrate. Stamens diadelphous; anthers roundish. Ovary subsessile, 1–2 ovulate; style incurved, bearded upwards; stigma slightly oblique. Pod ripening beneath the ground, roundish, 1–2-seeded.

A single species.

1. **V. subterranea,** *Thouars; DC. Prod.* ii. 474. Petioles slender, 4–8 in. long, arising from a wide-creeping pubescent rhizome; leaflets 3, oblong or lanceolate, $1\frac{1}{2}$–3 in. long by half or quarter as broad, both sides glabrous or the lower finely bristly on the nerves; petiolules 6–9 lines long; stipellæ minute, blunt. Peduncles flexuous, bearing 1–3 flowers, at first 2–6 lines long, cernuous. Calyx a line deep. Corolla yellow, 3–4 lines long, often abortive. Peduncle becoming elongated and deflexed, so as to thrust the ovary into the soil, where it becomes a tuber-like pod, half an inch or more long, containing one or two small yellow mottled seeds.—Guill. et Perr. Fl. Seneg. 254.

Cultivated all through Tropical Africa. The native country not clearly known.

66. **PACHYRHIZUS**, Rich.; Benth. et Hook. f. Gen. Plant. i. 540.

Calyx with the two upper teeth subconnate, the others equal, lanceolate. Standard broad-obovate, appendiculate at the base with inflexed auricles; wings oblong, falcate; keel incurved, obtuse, equalling the wings. Stamens diadelphous or monadelphous; anthers uniform. Ovary subsessile, multiovulate; style moderately thick, the apex subinvolute, flattened on the inner side; stigma globose, oblique. Pod linear, subcompressed, depressed transversely between the seeds and septate within. —Climbing herbs.

Two or perhaps three species, one of which inhabits Mexico.

Stamens diadelphous; bracts setaceous . . . . . 1. *P. angulatus.*
Stamens monadelphous; bracts lanceolate . . . . . 2. *P. orbicularis.*

1. **P. angulatus,** *Rich. in DC. Prod.* ii. 402. Root a tuber like a turnip, eatable. Stems perennial, firm, wide-twining, subglabrous. Stipules small, linear or lanceolate. Petioles firm, subglabrous, 2–6 in. long; leaflets 3, roundish, usually more or less rhomboidal, often sinuate-lobate, 4–6 in. each way, both sides glabrous or the lower thinly adpressed grey-silky when young. Flowers in ample racemes 4–6 in. long on firm peduncles often equalling them. Bracts and bracteoles small, setaceous. Pedicels 2–3 lines long, silky. Calyx 3–4 lines deep, silky, the teeth reaching about halfway down. Corolla reddish, an inch or more deep. Pod 6–9 in. long, 8–9 lines broad, subcompressed, distinctly constricted vertically, 9–12-seeded. — *Taeniocarpum articulatum*, Desv. in Ann. Sc. Nat., Sér. 1, ix. 421.

Upper Guinea. Senegambia, *Leprieur and Perrottet!* Guinea proper, *Barter!*
Nile Land. Banks of the White Nile, *Petherick!* Madi, *Speke and Grant!* Abyssinia, *Schimper!*
Cultivated throughout the Tropics, the native country not clearly known.

2. **P.? orbicularis,** *Welw. mss.* Stems wide-climbing, finely downy. Stipules lanceolate, $\frac{1}{4}$ in. Petioles 3–4 in.; leaflets 3, subcoriaceous, glabrescent above, finely downy below; end one suborbicular, rather broader than deep, 3–$3\frac{1}{2}$ in. long, blunt with a minute distinct mucro; petiolule 18–21 lines; lateral ones short-stalked, unequal-sided; stipellæ spreading linear. Flowers in long-peduncled close racemes 3–4 in. long. Bracts lanceolate boatshaped, 3–4 lines, deciduous. Pedicels very short. Calyx $\frac{1}{4}$ in., densely velvety, upper teeth subconnate, lowest lanceolate, as long as the tube. Corolla pale yellowish, not much exceeding the calyx. Stamens monadelphous. Ovary linear, downy, multiovulate; style glabrous, much incurved; stigma oblique. Pod unknown.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

67. **PSOPHOCARPUS,** Neck.; Benth. et Hook. f. Gen. Plant. i. 540.

Calyx with the two upper teeth subconnate, the lowest rather longer than the two lateral ones. Standard suborbicular, appendiculate at the base, with inflexed auricles; wings obliquely obovate; keel incurved, obtuse. Upper stamen free at the base, connate with the others at the middle; anthers uniform. Ovary shortly stalked, multiovulate; style incrassated above the ovary, subulate, incurved; stigma globose, terminal or introrse, densely penicillate. Pod tetragonous, with a wing to each angle, two-valved, filled up between the seeds.—Wide-climbing herbs.

1. **P. longepedunculatus,** *Hassk. Pl. Jav.* 388. Root tuberous. Stem firm herbaceous, wide-climbing, subglabrous. Stipules 4–6 lines long, subpeltate. Petioles firm, glabrous, 3–4 in. long; leaflets 3, broad-ovate or rhomboidal or slightly hastate, 3–4 in. each way;

stipellæ small, lanceolate, rigid; both sides glabrous, or the lower slightly adpressed grey-silky when young. Flowers in moderately dense racemes sometimes 6 in. long on firm peduncles 3 in. to a foot long. Bracteoles ovate, blunt or cuspidate, persistent, glabrous, striated, equalling or exceeding the calyx, which is 4 lines deep, subglabrous, the upper lip obtuse, emarginate, the lateral teeth deltoid, the lowest lanceolate, shorter than the tube. Corolla lilac, an inch deep, turning black when dried. Pod 2–3 in. long, ¼ in. thick without the wings, which are about 2 lines broad, glabrous, 5–6-seeded.—*P. palmettorum*, Guill. et Perr. Fl. Seneg. 221. *D. suffultus*, Grah. in Wall. Cat. 5564. *D. subæqualis*, Wall. Cat. 5539. *Diesingia scandens*, Endl. Atakta, 1, t. 1 and 2. β. *Barteri*, flowers white, leaflets large, subrotund, thinly grey-pubescent all over beneath, bracteoles silky, blunt, herbaceous, shorter than the calyx.

Upper Guinea. Senegambia, *Perrottet!* Old Calabar, *Rev. W. C. Thomson! Mann!* β. *Barteri*, Nupe, *Barter!*

Lower Guinea. Congo, *C. Smith!*

Mozamb. Distr. M'bwiga, lat. 7° 24′ S, alt. 1350 feet, *Speke and Grant!* Zambesi land, *Dr. Kirk!*

Cultivated throughout the Tropics, the native country not clearly known.—The allied *P. tetragonolobus*, DC., which has more slender stems, bracteoles shorter than the calyx, and a 12–16-seeded pod sometimes a foot long, is also widely cultivated. We have it from Mauritius, but not from the mainland within the Tropics.

68. **DOLICHOS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 540.

Calyx campanulate, the upper teeth usually connate, the others nearly equal. Standard orbicular, the base appendiculate with inflexed auricles; wings falcate obovate, adhering to the keel; keel much incurved, usually rostrate, not spiral. Upper stamen free, often appendiculate or incrassated near the base; anthers uniform. Ovary subsessile, ∞-ovulate; style flattened upwards or filiform, longitudinally bearded near or penicillate at the apex, the stigma terminal. Pod many-seeded, linear, compressed, two-valved, the sutures incrassated, the valves nearly flat or slightly convex.—Climbing or erect herbs or undershrubs.

A moderately small genus as here defined, principally belonging to the Tropics of the Old World.

**Lablab.* Pod oblong, 2–4-seeded; style flattened upwards, narrowed at the base.
The only species . . . . . 1. *D. Lablab.*

***Dolichos proper.* Pod linear, many-seeded; style filiform, not narrowed at the base.
Flowers 1–3 on short axillary pedicels, without a common peduncle.
Stems wide-climbing.
Flowers 2–3 together; pods glabrescent.
Corolla 6–8 lines long . . . . . 2. *D. biflorus.*
Corolla 9–10 lines long . . . . . 3. *D. axillaris.*
Flowers solitary, rarely geminate; pods pubescent . . 4. *D. uniflorus.*
Stems not at all or very slightly climbing.
Leaflets not lobed.
Two upper teeth of calyx quite connate.
Stems erect; flowers solitary . . . . . 5. *D. brevicaulis.*

Stems trailing; flowers 2–4 together . . . . . 6. *D. rupestris.*
Two upper teeth not connate . . . . . 7. *D. stipulosus.*
Leaflets lobed . . . . . 8. *D. Oliveri.*
Flowers 1–2 together on an elongated peduncle.
Young stems glabrous . . . . . 9. *D. andongensis.*
Young stems clothed with tawny deflexed silky hairs . 10. *D. debilis.*
Flowers racemose.
Stems slender, wide-climbing.
Calyx-teeth acute.
Racemes 3–4-flowered . . . . . 11. *D. formosus.*
Racemes 6–8-flowered . . . . . 12. *D. reticulatus.*
Calyx-teeth blunt . . . . . 13. *D. stenocarpus.*
Stems suffruticose erect.
Style not twisted.
Leaves with the flowers. Corolla an inch deep, bright yellow . . . . . 14. *D. densiflorus.*
Leaves after the flowers. Corolla $\frac{3}{8}$ inch deep, purplish 15. *D. Dongaluta.*
Style much twisted at the base (§ *Streptostylis*, Welw. mss.).
Corolla half an inch long. Leaves thinly grey-canescent below.
End leaflet rotundate-deltoid . . . . . 16. *D. elatus.*
End leaflet ovate-lanceolate . . . . . 17. *D. pseudo-cajanus.*
Corolla an inch long. Leaves clothed beneath with thick shining whitish tomentum. . . . . 18. *D. splendens.*

1. **D. Lablab,** *Linn. Sp. Pl.* 1019. A wide-climbing perennial, with subglabrous stems. Leaflets 3, membranous, acute, glabrous above, nearly or quite so below; central one ovate-deltoid, 3–6 in. long, broadly spathulately narrowed at the base. Flowers in fascicled lax racemes 3–6 in. long, on firm elongated peduncles. Calyx broadly campanulate, $2\frac{1}{2}$–3 lines long, subglabrous, with a pair of roundish deciduous bracteoles at the base, two upper teeth connate, the others shorter than the tube. Corolla reddish or pale, 6–9 lines deep, the keel abruptly incurved. Pod $1\frac{1}{2}$–2 in. long, 7–10 lines broad, narrowed at the base, the upper suture nearly straight, the faces glabrescent, rarely persistently pubescent; seeds 2–4; style flattened upwards, not twisted, narrowed at the base.—Bot. Mag. t. 896. *Lablab vulgaris*, Savi, DC. Prod. ii. 401. *L. uncinatus*, A. Braun in Schimp. Hb. Abyss. *D. crenatifructus*, Steud. in Schimp. Hb. Abyss. 513. *D. purpureus*, Linn., Bot. Mag. t. 830.

Upper Guinea. Niger country, *Vogel! Mann!*
Nile Land. Nubia, *Schweinfurth!* Abyssinia, *Schimper!* and others. Unyoro and Karaguè, *Speke and Grant!*
Lower Guinea. Loanda, Mossamedes, Barra do Bengo, and a form with pubescent pods in Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
Cultivated everywhere in the Tropics.

2. **D. biflorus,** *L.; DC. Prod.* ii. 398. Stems very wide-climbing, slender, slightly pubescent. Stipules lanceolate, $1\frac{1}{2}$–2 lines. Petioles 6–8 lines; leaflets oblong, blunt, subglabrescent, the end one 9–12 lines long, on a petiolule $1\frac{1}{2}$–2 lines long; lateral ones very unequal-sided; stipellæ minute, linear. Flowers 1–3 on very short pedicels in

the axils of the leaves. Calyx 1½–2 lines, slightly downy, the upper teeth quite connate, the side ones lanceolate, the lowest linear, twice the tube. Corolla 6–8 lines long, yellow, the standard considerably exceeding the other petals. Pod linear, subsessile, nearly straight, glabrous, 12–15 lines long, 2 lines broad, 6–8-seeded, tipped with a persistent style ¼ in. long.

Upper Guinea. Nupe, *Barter!*
Lower Guinea. Loando and Golungo Alto, and a variety with small blunt, more pubescent leaflets and rather larger flowers, in Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Inhamagera, 7° S. lat., *Speke and Grant!* Zambesi land, *Dr. Kirk!*
Common in Tropical Asia.

3. **D. axillaris,** *E. Meyer, Comm. Pl. Afr.* 144. Stem very wide-climbing, firm, slender, glabrous or finely downy. Bracts lanceolate, 2–3 lines. Petioles 12–18 lines; leaflets ovate, acute, quite glabrous, the end one 1½–2 in. long on a petiolule ⅜ in. long, lateral ones unequal-sided; stipellæ minute setaceous. Flowers 2–3 on short pedicels in the axils of the leaves. Calyx ¼ in. long, glabrous, the upper teeth quite connate, the others lanceolate, about equalling the tube. Corolla yellow, tinged with green, ¾–⅞ in. long, the standard 5–6 lines broad, not longer than the other petals. Pod 1½–2 in. long, 3–4 lines broad, glabrous, narrowed into a pedicel as long as the calyx, slightly recurved, 5–8-seeded, tipped with a persistent style 5–6 lines long.—*Clitoria viridiflora*, Bouton in Hook. Ic. Plant. t. 152.

Nile Land. Abyssinia, *Schimper!*
Lower Guinea. Highlands of Huilla and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Between Tette and the coast, *Dr. Kirk!*
Also a plant of Madagascar, Mauritius, and the Cape.

4. **D. uniflorus,** *Lam.; DC. Prod.* ii. 398. Annual, with pubescent stems, suberect, or when elongated more or less twining. Stipules ovate-lanceolate, 3–4 lines. Petioles 1–2 in.; leaflets ovate, blunt, faintly mucronate, glabrescent above, finely downy below, the end 1½–2 in. long on a petiolule 3–4 lines long; lateral leaflets unequal-sided; stipellæ minute linear-setaceous. Flowers copious, solitary in the axils of the leaves on very short pedicels. Calyx 4–6 lines; teeth linear-setaceous; upper not connate more than halfway up; lowest 3–4 times the tube. Corolla yellow, 6–8 lines. Pod linear, much recurved, sessile, 1½–2 in. long, 3–4 lines broad, finely downy, 6–8-seeded, tipped with a persistent style 3–4 lines long.—*D. Daltoni*, Webb, Fl. Nigr. 125.

Nile Land. Abyssinia, *Schimper! Schweinfurth!*
Common in Tropical Asia, and the Cape Verde *D. Daltoni* is evidently the same.

5. **D. brevicaulis,** *Baker.* A perennial with a wide-creeping slender rootstock. Stems erect, densely grey-downy, a few inches high. Stipules lanceolate, persistent, 1½–2 lines. Petioles erecto-patent, 8–12 lines; leaflets oblanceolate-oblong, both sides, especially the under one, closely grey-pubescent, the end one 15–18 lines long,

subacute ; petiolule not above a line long ; side-leaflets oblique. Flowers solitary on short downy pedicels from the close nodes. Calyx 2½–3 lines, densely grey-downy, with two linear bracteoles at the base; teeth linear-setaceous, exceeding the tube, the two upper connate, the lowest the longest. Corolla ¾ in., bright yellow. Ovary linear, grey-downy, multiovulate. Pod not seen.

Upper Guinea. Near Jeba on the Quorra, *Barter !*

6. **D. rupestris,** *Welw. mss.* A perennial with short trailing firm finely grey-silky stems. Stipules lanceolate, persistent, 3–4 lines. Petioles erect, 1½–2 in. ; leaflets oblong, coriaceous, blunt, mucronate, 1½–2 in. long, inconspicuously grey-silky on both sides, the end one on a petiolule ⅛–¼ in. long. Flowers 2–4 together on short pedicels from the axils of the leaves. Calyx 2½ lines, densely clothed with adpressed grey silky hairs; teeth lanceolate, as long as the tube, the two upper quite connate. Corolla bright yellow, ½ in. long. Pod linear, 7–8-seeded, nearly straight, finely silky when young, not seen fully mature.

Lower Guinea. Highlands of Huilla, 4000 feet, *Dr. Welwitsch !*

7. **D. stipulosus,** *Welw. mss.* An erect or diffuse perennial, with cæspitose finely grey-downy stems reaching a foot high. Stipules 3–6 lines, lanceolate, persistent, prominently ribbed. Leaflets 3, or of the lowest leaves solitary, oblanceolate, rather fleshy, at first slightly silky, glabrescent, acute, 1½–2 in. long ; petiolule 2–4 lines. Flowers in pairs on short pedicels from the axils of the leaves. Calyx ½ in. long, thinly silky, with 5 subequal teeth considerably exceeding the tube, below the base of which are a pair of linear bracteoles. Corolla bright yellow, ¾–⅞ in. long. Ovary linear, finely silky, 6–8-ovulate. Pod not seen.

Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch !*

Another plant, gathered by Dr. Welwitsch in Huilla, may perhaps come in here. It is an erect perennial, a foot high, with nearly sessile leaves, three short-stalked lanceolate acute leaflets 2–3 in. long, prominently triplinerved beneath, flowers in pairs on short axillary pedicels; calyx ½ in. deep, with teeth exceeding the tube; pod 5–6-seeded, finely downy, 1½ in. long, ⅜ in. broad, narrowed to both ends.

8. **D. Oliveri,** *Schweinf. in Verh. Zool. Bot. Gesell. Wien,* xviii. 656. Stems erect, woody, finely grey-silky, with elongated branches subpendulous upwards. Stipules minute, lanceolate, silky. Petiole silky, 9–12 lines long ; leaflets 3, stipellate, the central one 18–24 lines long, rhomboid with two shallow rounded lobes below the middle, on a petiolule 3–4 lines long, the lateral ones unequal-sided, short-stalked, both sides, especially the under one, grey-silky. Flowers 1–2 in the axils of the leaves on silky pedicels 1½–2 lines long or laxly racemose to the end of the branches. Bracts ovate, minute. Bracteoles minute, persistent, silky, linear-lanceolate. Calyx turbinate, silky, 2½ lines deep, the deltoid teeth reaching a third down, the two upper connate. Corolla yellow, 6–7 lines deep, glabrous. Pod linear, falcate, 2 in. long, 4 lines broad, 6–7-seeded, glabrous when mature.

Nile Land. Abyssinia, Matamma, *Schweinfurth !*

9. **D. andongensis,** *Welw. mss.* Stems very slender, wide-climbing, quite glabrous. Stipules $\frac{1}{8}$ in., lanceolate, reflexed. Petioles 12–15 lines, very slender; leaflets 3, membranous, quite glabrous, the end one ovate-deltoid, subacute; petiolule 4–6 lines, side ones very oblique. Peduncles 1–2-flowered, very slender, at most equalling the leaves. Pedicels 1–3 lines. Calyx $2\frac{1}{2}$ lines, campanulate, glabrous; teeth shorter than tube, the upper pair connate. Corolla red, twice the calyx. Pod 21–24 lines long, 4 lines broad, glabrous, falcately reflexed, 7–8-seeded; style twisted at base, $\frac{1}{4}$ in. long.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

10. **D. debilis,** *Hochst. in Schimp. Herb. Abyss.* No. 1440. Stems very slender, wide-climbing, clothed when young with fine deflexed tawny pubescence. Stipules 2 lines, linear, reflexed. Petioles $1\frac{1}{2}$–2 in., very slender; leaflets 3, membranous, finely-silky when young, glabrescent; central ovate-acuminate, $1\frac{1}{2}$–2 in. long; petiolule $\frac{1}{4}$–$\frac{1}{2}$ in., side ones very oblique. Peduncles very slender, 1–2-flowered, at most equalling the leaves. Calyx $\frac{1}{8}$ in., slightly pubescent, the teeth shorter than the tube, the upper pair connate. Corolla pale red, three times the calyx. Pod glabrous, linear, recurved, 6–7-seeded, not seen fully mature; style $\frac{1}{4}$ in. long, twisted at the base.—A. Rich. Fl. Abyss. i. 223.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit!*

11. **D. formosus,** *A. Rich. Fl. Abyss.* i. 225. Stems wide-twining, finely downy when young. Stipules 2–$2\frac{1}{2}$ lines, blunt, scarious. Petioles 2–4 in.; leaflets 3, membranous, ovate-acuminate, glabrous on both sides when mature; the central one 2–3 in. long; side ones very oblique. Racemes 3–4-flowered on spreading peduncles reaching 2–3 in. long. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., finely downy. Calyx campanulate, slightly silky, $\frac{3}{8}$ in. deep, the upper teeth connate, the side ones deltoid, the lowest lanceolate. Corolla red, twice the calyx. Pod 2–3 in. long, $\frac{3}{8}$ in. broad, membranous, glabrous, blunt, much reflexed, 8–10-seeded.

Nile Land. Abyssinia, *Schimper!* and others; and a variety with downy stems and leaves, and pod clothed with persistent grey tomentum.

A. Richard describes also a *D.? mitis*, gathered in Abyssinia by Quartin-Dillon, which, so far as known, differs from this by its rhomboidal end-leaflets and pods attenuated at the point.

12. **D. stenocarpus**, *Hochst. in Schimp. Hb. Abyss.* No. 1450. Stems firm, wide-climbing, glabrous. Stipules lanceolate, $1\frac{1}{2}$–2 in. Petiole 2–3 in.; leaflets subcoriaceous, quite glabrous; central one ovate acuminate, 3–4 in. long; petiolule 9–12 lines; side ones equal or slightly oblique. Peduncles firm, spreading, 3–4 in. long; racemes 3–12-flowered. Pedicels 2–3 lines, their base swollen and persistent. Calyx glabrous, $2\frac{1}{2}$ lines deep, the teeth short and bluntly rounded. Corolla red, an inch long; standard round, 8–9 lines broad. Pod 4–5 in. long,

hard, straight, 2½ lines thick, the sutures much incrassated; seeds 15–18.—A. Rich. Fl. Abyss. i. 224.

Nile Land. Sennaar, *Knoblecher.* Abyssinia, *Schimper! Schweinfurth!* Usui slopes, *Speke and Grant!*

13. **D. reticulatus,** *A. Rich. Fl. Abyss.* i. 225. Stems herbaceous, twining, terete, scarcely pubescent. Stipules lanceolate, striated. Leaflets ovate-oblong, acuminate, both sides glabrous, the lower with the veinlets raised. Racemes 6–8-flowered, the peduncles equalling the leaves. Pedicels moderately long, pubescent and glandular like the calyx, the 5 teeth of which are linear-lanceolate, the lowest longer than the others. Corolla violet. Pod not known.

Nile Land. Abyssinia, *Quartín-Dillon.* Not seen.

14. **D. densiflorus,** *Welw. mss.* Root tuberous. Stems 1–3 ft. high, erect or ascending, cæspitose, suffruticose, clothed with persistent grey pubescence. Stipules ½–⅜ in., persistent, downy on the back. Petioles stiff, erecto-patent, scarcely exceeding the stipules; leaflets oblong or obovate-oblong, coriaceous, reaching 1¾–2 in. long, upper side glabrous, lower persistently grey silky, blunt, emarginate; petiolule ¼–⅜ in., side ones not oblique; stipellæ minute, lanceolate, downy. Flowers 6–8 in congested subsessile axillary racemes. Bracts lanceolate, densely grey-silky. Pedicels ⅛ in. Calyx ¼ in. deep, with a pair of lanceolate adpressed bracteoles at the base, densely grey-silky; teeth lanceolate, the upper pair connate. Corolla an inch long, bright yellow; standard ⅝ in. broad, considerably exceeding the equal wings and keel. Ovary linear, densely grey-silky, multiovulate; style not twisted. Pod unknown.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

15. **D.? Dongaluta,** *Welw. mss.* Rootstock perennial, carnoso-fibrous. Stems cæspitose, suffruticose, 1–2 ft. high, erect, simple or forked, glabrous. Stipules scarious, deltoid, 2–3 lines. Petioles 12–18 lines, rigidly erecto-patent; leaflets 3, rigidly subcoriaceous, glabrous, the end one oblong or lanceolate, bluntish or subacute, reaching 3–4 in. long, triplinerved; petiolule 9–12 lines; side ones scarcely at all oblique. Flowers produced when the leaves are very young in subsessile 6–12-flowered congested axillary racemes. Pedicels reaching 3–4 lines. Calyx purplish, membranous, glabrous, ⅛ in. deep, with two minute setaceous bracteoles at the base; teeth lanceolate-cuspidate, shorter than the tube, the upper two connate. Corolla purplish, ⅜ in.; standard reflexed, orbicular, ¼ in. broad. Ovary 3–4-ovulate; style glabrous, not twisted; stigma penicillate. Pod unknown.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*
Flowers produced in February; fully-developed leaves in May.

16. **D. elatus,** *Welw. mss.* An erect shrub 6–7 ft. high, with sulcate stiff persistently grey-downy branches. Stipules linear, ¼ in. Petioles downy, erecto-patent, 1½–2 in.; leaflets 3, subcoriaceous, gla-

brescent above, persistently thinly grey-canescent beneath, the end one rotundate-deltoid, 3–4 in. long and broad, bluntish with a mucro; petiolule 9–12 lines; lateral very unequal-sided. Flowers in ample terminal panicles, with dense-flowered erecto-patent racemose branches. Pedicels very silky, $\frac{1}{8}$ in. Calyx 2 lines, finely grey-silky; upper lip truncate; 3 lower teeth deltoid, very short. Corolla red, $\frac{1}{2}$ in. long. Ovary linear, densely grey-velvety, multiovulate; style $\frac{1}{4}$ in., twisted at base. Pod not seen.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

17. **D. pseudo-cajanus,** *Welw. mss.* An erect undershrub 2–3 ft. high with sulcate terete finely grey silky branches. Stipules lanceolate, 5–6 lines. Leaflets 3, glabrescent above, persistently thinly grey silky beneath, end one oblong-lanceolate, 4–5 in. long; petiolule 6–9 lines; lateral ones scarcely unequal-sided. Flowers in copious subsessile axillary corymbs passing at the top of the branches into a short raceme. Pedicels 1–2 lines, densely silky. Calyx $2\frac{1}{2}$ lines, finely silky; teeth lanceolate, shorter than the tube, upper pair connate. Corolla reddish, twice the calyx. Pod linear, straight, 18–21 lines long, $\frac{3}{8}$ in. broad, slightly downy, 6–7-seeded, narrowed at the base; style $\frac{1}{4}$ in., twisted at the base.

Lower Guinea. Highlands of Pungo Andongo, *Dr. Welwitsch!*

18. **D. splendens,** *Welw. mss.* An erect simple or slightly branched undershrub, 2–3 ft. high, with stout sulcate densely grey-silky stems. Stipules lanceolate, 5–6 lines. Petioles 2–3 in.; leaflets 3, glabrescent above, densely clothed beneath with persistent shining thick grey silky tomentum; end one ovate or lanceolate, acute, reaching 3–4 in. long; petiolule 12–15 lines; lateral ones rather unequal-sided. Flowers in long lax terminal racemes reaching down among the leaves. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., densely silky. Calyx $\frac{1}{2}$ in., finely grey-silky; three lower teeth linear, exceeding tube, upper pair connate. Corolla bright red, 1 in. deep, standard $\frac{1}{2}$ in. broad. Pod linear, 2–$2\frac{1}{2}$ in. long, 4 lines broad, recurved, 7–8-seeded, persistently grey downy; style $\frac{1}{2}$ in. long, twisted at the base.

Lower Guinea. Highlands of Huilla and Pungo Andongo, *Dr. Welwitsch!*

69. **CAJANUS,** DC.; Benth. et Hook. f. Gen. Plant. i. 541.

Calyx with the two upper teeth connate, the others equal. Standard orbicular, reflexed, the base appendiculate with inflexed auricles; wings obliquely obovate; keel with an incurved apex, truncate. Upper stamen free, the others connate; anthers uniform. Ovary subsessile, multiovulate; style incrassated above the middle, beardless, slightly dilated below the obliquely terminal stigma. Pod linear, obliquely acute, compressed, two-valved, with transverse constrictions between the seeds on the outside, scarcely septate within.

A single species.

1. **C. indicus,** *Spreng. Syst. Veg.* iii. 248. An erect shrub 8–10 ft. high, the branches woody, angular, and finely adpressed grey-silky. Stipules small, lanceolate, deciduous. Petioles $\frac{1}{2}$–2 in. long, firm; leaflets 3, oblong or oblong-lanceolate, 2–3 in. long, acute, subcoriaceous, upper surface glabrous, lower grey-silvery with the veins raised. Flowers in 2–8-flowered axillary racemes on short firm erecto-patent peduncles. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. long. Calyx silky, 3–4 lines deep, the teeth lanceolate, not reaching half down. Bracts broad-ovate, acuminate, deciduous. Corolla $\frac{5}{8}$–$\frac{3}{4}$ in. deep, the standard yellow or veined with purple. Pod 2–3 in. long, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, 3–5-seeded, finely pubescent.—*Cytisus Cajan*, Linn. Sp. Pl. 1041. *C. pseudo-cajan*, Jacq. Hort. Vind. ii. t. 119. *Cajanus bicolor*, DC. Prod. ii. 406. Bot. Reg. 1845, t. 31. *C. flavus*, DC. Prod. l.c. *Cytisus guineensis*, Schum. et Thonn. Pl. Guin. 349.

Upper Guinea. Princes Island, *Mann!* Sierra Leone, called the Congo Bean, *Dr. Kirk! Afzelius!* Guinea, *Schumacher and Thonning.*

Nile Land. Nubia, *Kotschy! Binder.* Unyoro, *Speke and Grant!*

Lower Guinea. Congo, *Capt. Burton!* Loanda and Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zanzibar Island (*fide Kotschy*). Zambesi land, *Dr. Stewart!*

Cultivated throughout the Tropics. "Met with and cultivated everywhere; tastes like a coarse description of field peas; the Wahiyow strike a light by using its wood and a reed." *Speke and Grant.*

70. **RHYNCHOSIA,** Lour.; Benth. et Hook. f. Gen. Plant. i. 542.

Upper teeth of the calyx more or less connate, the lowest longer than the others. Standard obovate or orbicular, patent or reflexed, the base appendiculate with inflexed auricles; wings narrow; keel incurved at the apex. Upper stamen free, the others connate; anthers uniform. Ovary subsessile, biovulate in all our species; style incurved upwards, filiform or incrassated; stigma small, terminal. Pod subcompressed, falcate-oblong, two-valved, continuous or rarely septate internally. Seeds two or by abortion one.—Twining shrubs or undershrubs.

A large genus, dispersed throughout the tropics, also Cape, and a few species in temperate North America.

* **Cyanospermum** (*Wight and Arn.*). Robust woody climbers, with racemose inflorescence. Calyx as long as the constricted pod. Corolla persistent, usually bright red.

Calyx-teeth acute.
- Upper tooth of calyx half as long as the standard . . . . 1. *R. Mannii.*
- Upper tooth of calyx as long as the standard . . . . . 2. *R. congensis.*

Calyx-teeth blunt.
- Corolla bright red.
  - Branches and leaves subglabrous . . . . . 3. *R. calycina.*
  - Branches and leaves densely pubescent . . . . . 4. *R. cyanosperma.*
- Corolla yellow . . . . . 5. *R. resinosa.*

** **Copisma** (*E. Meyer*). Twining herbs or undershrubs, with flowers in stalked racemes (reduced to 1–2 in sp. 11). Pods exserted and constricted. Corolla marcescent, yellow or red.

Stipules minute setaceous.
Lateral leaflets unequal-sided; flowers racemose.
Corolla $\frac{5}{8}$ in. long.
Leaves subglabrous . . . . . 6. *R. flavissima.*
Leaves tomentose . . . . . 7. *R. splendens.*
Corolla $\frac{3}{8}$ in. long.
Stem and leaves beneath subglabrous . . . . . 8. *R. minima.*
Stem and leaves beneath finely grey-silky . . . . . 9. *R. caribœa.*
Stem and leaves beneath densely grey-silky . . . . 10. *R. Memnonia.*
Lateral leaves equal-sided; flowers 1–2 . . . . . 11. *R. filicaulis.*
Stipules linear, 2–3 lines long.
Stems subglabrous.
Calyx-teeth lanceolate; corolla twice the calyx . . . . 12. *R. latissima.*
Calyx-teeth linear; corolla half as long again as the calyx 13. *R. elegans.*
Stems densely ferrugineo-pubescent . . . . . 14. *R. ferruginea.*
Stipules ovate, $\frac{1}{2}$ in. long . . . . . 15. *R. viscosa.*

*** **Arcyphyllum** (*Ell.*). Twining herbs, with flowers in dense clusters. Pods exserted, scarcely constricted. Corolla bright red, marcescent.
Calyx $\frac{1}{4}$ in. long . . . . . 16. *R. debilis.*
Calyx $\frac{1}{8}$ in. long . . . . . 17. *R. densiflora.*

**** **Dolichoides.** A twining herb, with the flowers solitary or in pairs in the axils of the leaves. Pod not constricted.
The only species . . . . . 18. *R. Grantii.*

1. **R. Mannii,** *Baker*. Stem woody, wide-climbing, glabrous. Stipules ovate, membranous. Petioles 2 in. long, slender, glabrous; leaflets 3, the central one roundish, 3 in. long, nearly as broad, cuspidate, the petiolule an inch long, lateral ones unequal-sided, subcoriaceous, both sides green and glabrous, the upper one rather glossy. Stipellæ setaceous $\frac{1}{4}$ in. long. Flowers in dense racemes 4-5 in. long, on firm woody peduncles as long as themselves. Bracts like the stipules. Calyx $\frac{3}{4}$ in. long, cut down to the base, quite glabrous, the upper tooth only half as long as the others, emarginate, the lowest rather longer than the middle one, all lanceolate, acute. Corolla bright red, equalling the calyx. Pod $\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad, bright glaucous grey-velvety.

Upper Guinea. Fernando Po, *Mann!*

2. **R. congensis,** *Baker*. Stems suffruticose, twining, clothed with fine grey pubescence. Stipules ovate, membranous. Petioles 2–3 in. long, pubescent; leaflets 3, the central one roundish, 3–4 in. long, cuspidate, the petiolule an inch long, the lateral ones unequal-sided, both sides glabrous. Flowers in dense nearly sessile racemes 3–5 in. long. Bracts like the stipules. Calyx $\frac{3}{4}$ in. long, cut down to the base, finely pubescent, the upper lip 2 lines broad, bifid halfway down, the others acute. Corolla bright red, equalling the calyx. Pod $\frac{3}{4}$ in. long, $\frac{1}{4}$ in. broad, densely grey-velvety.

Lower Guinea. Congo, *C. Smith! Capt. Burton!*

3. **R. calycina,** *Guill. et Perr. Fl. Seneg.* 214. Stems woody, long, wide-twining, terete, glabrous or slightly grey-downy. Stipules ovate, membranous, deciduous. Petioles 1–3 in. long, subglabrous; leaflets

3; central one roundish, 3–5 in. each way, cuspidate; petiolule 1–1½ in. long; lateral ones unequal-sided; texture thin but subcoriaceous, both sides green, glabrous. Flowers in dense racemes 3–4 in. long, on short woody peduncles. Bracts ovate-lanceolate, scarious, slightly silky. Pedicels silky, 3–4 lines long. Calyx ¾ in. long, densely grey-pubescent, cut down nearly to the base, the upper lip spathulate, ⅜ in. broad, slightly bifid, the side ones shorter, ⅛ in. broad, the lowest longer, ¼ in. broad, all blunt. Corolla bright red, equalling the calyx. Pod oblong, equalling the calyx, ¼ in. broad, densely grey-velvety.—*Cyanospermum calycinum*, Hook. f. Fl. Nigr. 312. *Cylista? pycnostachya*, DC. Prod. ii. 410.

Upper Guinea. Senegambia, *Leprieur and Perrottet! Ingram!* Sierra Leone, *Smeathmann! Don! Afzelius! Vogel! Barter!* Fernando Po, *Barter! Mann!* (One of the specimens with the leaves thicker in texture and thinly silky beneath.)

4. **R. cyanosperma,** *Benth. mss.* Stems woody, wide-climbing, terete, densely grey or ferruginous-pubescent when young. Stipules ovate, scarious, pubescent. Petioles 3–4 in. long, firm, clothed like the branches; leaflets 3, coriaceous, central one roundish, 4–5 in. long, cuspidate, petiolule ½ in. long; lateral ones unequal-sided; upper surface thinly and the lower densely grey-pubescent, the veins ferruginous. Flowers in moderately lax racemes 6–9 in. long on firm woody peduncles. Bracts ovate-lanceolate, ½ in. long, densely grey-silky, deciduous. Pedicels ¼ in. long. Calyx an inch deep, densely matted on the back with grey tomentum, cut down nearly to the base, the upper lobe spathulate ⅝ in. broad, deeply bifid, the others blunt about 2 lines broad, the lowest the longest. Corolla bright red, sometimes white, equalling the calyx. Pod oblong, equalling the calyx, densely grey-velvety.—*Cylista tomentosa*, Roxb. DC. Prod. ii. 410. *Cyanospermum tomentosum*, Wight et Arn. Prod. Fl. Pen. Ind. Or. 260. *Cylista albiflora*, Bot. Mag. t. 1859 (a white-flowered variety).

Mozamb. Distr. Zambesi land, Manganya hills, *Dr. Meller! Dr. Stewart!* Also a native of the Mascarene isles and East Indies.

5. **R. resinosa,** *Hochst. in Schimp. Hb. Abyss.* No. 317. Stems woody, wide-twining, terete, finely glandular and grey pubescent. Stipules lanceolate, ¼ in. long, scarious. Petiole 2–3 in. long, firm, glandular and pubescent; leaflets 3, broad ovate-rhomboidal, 2–3 in. each way, acute, the base rounded or broad-cuneate, petiolule ½–¾ in. long; lateral ones very unequal-sided, subcoriaceous, both sides green, lower slightly downy and glandular on the veins. Flowers in dense or moderately lax racemes 2–3 in. long on firm woody peduncles. Bracts ovate, viscous, ¼ in. deep, deciduous. Calyx ⅝–¾ in. deep, viscous, tube ¼ in. deep, teeth blunt, the upper ones connate, bifid at the apex, the lowest longer than the side ones, persistent and becoming membranous. Corolla yellow, equalling the calyx, enclosing the pod, which is ½ in. long, half as broad, slightly pubescent.—*Fagelia resinosa*, A. Rich. Fl. Abyss. i. 226.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon, Plowden!* Nubia, *Petherick!*

6. **R. flavissima,** *Hochst. in Schimp. Hb. Abyss.* No. 2244. Stems firm-herbaceous, wide-twining, terete, subglabrous. Stipules minute, setaceous. Petiole an inch or less long, firm; leaflets 3; central one broad-ovate, 1–1¼ in. each way, upper half deltoid, petiolule ¼–⅜ in. long; lateral ones very unequal-sided, both sides glabrous or the lower slightly grey-silky when young. Flowers in lax 6–12-flowered racemes 2–4 in. long on spreading peduncles which sometimes equal them. Bracts and bracteoles setaceous, deciduous. Pedicels a line long, cernuous. Calyx ¼ in. deep, glabrous; teeth lanceolate, reaching more than halfway down. Corolla ⅝ in. deep, yellow, not veined, the standard ⅜ in. broad, not silky. Pod ¾ in. long, blunt, narrowed gradually at the base, glabrous.—*R. sennaarensis,* Hochst. teste Schweinf. in Verh. Zool. Bot. Gesell. Wien. xviii. 655.

Nile Land. Abyssinia, *Schimper!* Sennaar and the White Nile country, *Schweinfurth!*

7. **R. splendens,** *Schweinf. in Verh. Zool. Bot. Gesell. Wien.* xviii. 654. Stems erect, clothed with white tomentum. Stipules deciduous. Leaflets obovate, elliptical, twice as long as the petiole, thinly white-silky above, densely clothed with white tomentum beneath. Racemes 12–16-flowered, exceeding the leaves. Pedicels ½ line long. Bracts exceeding the pedicels, caducous. Calyx half as long as the corolla, grey-silky, the very acute teeth reaching halfway down. Corolla yellow, ⅝ in. long, the standard silky on the outside. Ovary tomentose.

Nile Land. Abyssinia, *Schweinfurth.*
Distinguished from *R. Memnonia* by its erect habit and larger flowers.

8. **R. minima,** *DC. Prod.* ii. 385. Stems firm, herbaceous, slender, wide-twining, subglabrous. Stipules minute, setaceous. Petioles an inch or less long, firm, glabrous; leaflets 3; central one roundish or broad ovate, ¾–1 in. each way, blunt or subacute; petiolule ¼ in. long; lateral ones unequal-sided; texture firm, both sides subglabrous. Flowers in lax 6–12-flowered racemes 2–4 in. long on short firm peduncles. Bracts and bracteoles minute, setaceous, deciduous. Pedicels a line long. Calyx 2–2½ lines deep, subglabrous; teeth linear-setaceous, reaching more than halfway down. Corolla yellow, ⅜ in. deep, the standard not silky. Pod ¾ in. long, ¼ in. broad, narrowed to the base, bluntish, soon glabrous.—Guill. et Perr. Fl. Seneg. 214. Benth. in Mart. Fl. Bras. xxiv. t. 54, fig. 2; A. Rich. Fl. Abyss. i. 230. *G. rhombea,* Schum. et Thonn. Pl. Guin. 346. *R. nuda, medicaginea, rhombifolia, ervoidea* and *punctata,* DC. Prod. l.c. *Copisma tenue* and *falcatum,* E. Meyer, Comm. 136.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Leprieur and Perrottet! Roger! Heudelot!* Guinea proper, *Thonning, Barter!*
Nile Land. Nubia, *Kotschy! Schweinfurth! Petherick!* Abyssinia, *Quartin-Dillon and Petit!*
β. *R. flagellaris,* Fenzl in Flora, 1844, 132; racemes very lax, with the peduncle 12–18 in. long, sometimes branched with a leaf at the fork. Nubia, *Kotschy!*
Everywhere in the tropics, and also a plant of the Cape and United States.

9. **R. caribæa,** *DC. Prod.* ii. 385. Stems firm-herbaceous, slender, wide-twining, finely grey-pubescent. Stipules minute, setaceous. Petioles 1–1½ in. long, firm; leaflets 3, the central one broad-ovate, often subrhomboidal, sometimes a little repand, 1–1½ in. long, the petiolule ¼ in. long, the lateral ones unequal-sided, firm, under surface finely grey-silky. Flowers in lax racemes 2–6 in. long on short peduncles. Bracts and bracteoles minute, setaceous, deciduous. Pedicels a line long, cernuous. Calyx ¼ in. deep, thinly grey-silky, the teeth lanceolate acuminate, reaching more than half down. Corolla yellow, ⅜ in. deep, the standard sometimes veined. Pod ¾ in. long, ¼–⅜ in. broad, thinly grey-silky when young, more turgid than in its allies.—Guill. et Perr. Fl. Seneg. 213. *Glycine caribæa*, Jacq. Ic. Pl. Rar. t. 146. *G. sublobata*, Schum. et Thonn. Pl. Guin. 347. *Rhynchosia malacophylla*, Bojer, Hort. Maur. 104. *Glycine malacophylla*, Spreng. Syst. cur. post. 270. *G. mollis*, Hook. Exot. Flora, t. 201. *Copisma pictum*, E. Meyer, Comm. Pl. Afr. Austr. 135. *R. melanosperma*, Klotzsch in Peters' Mossamb. Bot. 30.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Leprieur and Perrottet! Heudelot!* Island of St. Thomas, *G. Don!* Guinea proper, *Hore! Thonning!*
Mozamb. Distr. M'geta, *Speke and Grant!* Zanzibar, *Bojer! Dr. Kirk!* Zambesi land, *Peters! Kirk! Meller!*

β. R. gibba, (E. Meyer, l. c. sub *Copismam*) leaves less silky, 1½–2 in. each way, the upper calyx-teeth deltoid, shorter than the lower ones. *R. inflata*, Bojer, Hort. Maur. l.c.

Nile Land. Banks of the White Nile, *Petherick!*
Mozamb. Distr. Zanzibar, *Speke!*
A plant also of the Cape and Tropical America. The two tropical plants quite agree with the two Cape forms united by Dr. Harvey. We cannot by the descriptions separate from this *R. intermedia*, Kotsch. and Peyr., Plantæ Tinneanæ, No. 10, and *R. pubescens*, DC. Prod. ii. 386, recorded doubtfully by De Candolle from Abyssinia and said by Kotschy to have been gathered by Binder in Nubia at 7° N. lat.

10. **R. Memnonia,** *DC. Prod.* ii. 386. Stems firm-herbaceous, suberect or twining, densely grey-silky. Stipules minute, setaceous. Petioles an inch or less long, firm; leaflets 3, central one nearly round, ½–1 in. each way, blunt, the lower half often subcuneate; petiolule ¼ in. long, lateral ones unequal-sided; texture subcoriaceous, both sides, especially the lower one, densely grey-silky. Flowers in lax 6–20-flowered racemes 2–6 in. long on short firm peduncles. Bracts and bracteoles minute, setaceous, deciduous. Pedicels a line long, silky, cernuous. Calyx 2–2½ lines deep, grey-silky, the teeth lanceolate, reaching about half down. Corolla yellow, ⅜ in. deep, the standard silky on the outside. Pod ⅝–¾ in. long, ¼ in. broad, finely grey-pubescent, narrowed at the base, bluntish.—Harv. Fl. Cap. ii. 253. *Glycine Memnonia*, Delile, Fl. Ægypt. 100, t. 38, fig. 3. *G. Schimperi*, Hochst. et Steud. in Schimp. Hb. Arab.

Nile Land. Nubia, Kordofan, and Sennaar, *Kotschy! Dr. Bromfield!* Abyssinia, *teste Schweinfurth.*
North Central. Banks of Lake Tschad, *Vogel!*
Lower Guinea. Mossamedes, *Dr. Welwitsch!*

β. *R. discolor*, Klotzsch in Peters' Mossamb. Bot. 30. Stems slender, wide-twining; leaves not so densely silky, racemes short and few-flowered, the axis slender and flexuose.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch.* (Perhaps distinct, more shrubby, with the few flowers solitary or geminate.)

Mozamb. Distr. Sofala, *Peters!*

Descends southward to the Cape, eastward to Arabia and Afghanistan. Var. β. connects this with the preceding.

11. **R. filicaulis,** *Welw. mss.* Stems very slender, wide-twining, obscurely pubescent. Stipules minute, setaceous. Petioles 1–2 lines; leaflets 3, subcoriaceous, lanceolate, acute, glabrescent above, glaucous and persistently downy below, the veins raised; end one 6–9 lines long; petiolule 1 line or less; lateral ones not at all unequal-sided. Flowers copious 1–2 together on short downy peduncles. Calyx 3–4 lines, finely downy, teeth linear, exceeding the tube. Corolla violet. Pod 1 in. long, 3–4 lines broad, narrowed to both ends, 2-seeded, densely clothed with fine silky hairs.

Lower Guinea. Huilla, in fields of Arachis, *Dr. Welwitsch!*

12. **R. latissima,** *Welw. mss.* A wide-climbing shrub with slender terete branches a little downy only towards the end. Stipules linear, deciduous. Petioles 1–3 in.; leaflets 3, membranous, quite glabrous on both sides; end one broad-ovate acuminate, $2\frac{1}{2}$–3 in.; petiolule 6–12 lines; lateral ones very unequal-sided. Flowers 2–12 in copious short-stalked terminal and lateral racemes. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in., finely downy. Calyx $\frac{3}{8}$ in., finely downy; teeth lanceolate, as long as the tube. Corolla yellow, twice the calyx; standard $\frac{5}{8}$ in. broad. Ovary short-stalked, densely viscous. Pod not seen.

Lower Guinea. Cazengo, *Dr. Welwitsch!*

13. **R. elegans,** *A. Rich. Fl. Abyss.* i. 228. Stems slender, firm, wide-twining, slightly grey-pubescent. Stipules $\frac{1}{4}$ in. long, ovate-acuminate, scarious, reflexed. Petioles $\frac{1}{2}$–$1\frac{1}{2}$ in. long, firm; leaflets 3, the central one broad ovate-acuminate, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long by 1–2 in. broad, the base rounded; petiolule $\frac{1}{2}$ in. long; lateral ones unequal-sided, texture firm, upper surface glabrous, the lower finely grey-pubescent especially on the raised veins. Flowers in lax 6–20-flowered racemes 3–4 in. long on short peduncles. Bracts like the stipules. Bracteoles linear, deciduous. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. long, cernuous, pubescent. Calyx $\frac{1}{2}$ in. deep, pubescent, the teeth linear-setaceous, reaching three-quarters down, the lowest longer than the others. Corolla $\frac{5}{8}$ in. deep; standard glabrous, yellow, distinctly veined with purple. Pod $1\frac{1}{4}$ in. long, $\frac{3}{8}$ in. broad, narrowed at the base and point, finely grey-pubescent when young.—*Glycine elegans*, Hochst. in Schimp. Hb. Abyss. No. 88.

Nile Land. Abyssinia, *Schimper!* and others.

14. **R. ferruginea,** *A. Rich. Fl. Abyss.* i. 229. Stems herbaceous, slender, wide-twining, densely clothed with spreading ferruginous pu-

bescence. Stipules lanceolate, scarious, $\frac{1}{4}$ in. deep. Petioles $\frac{3}{4}$–1 in. long; leaflets 3, central broad-ovate, $1\frac{1}{2}$ in. long, mucronate; petiolule $\frac{1}{4}$ in. long; lateral ones unequal-sided, texture firm, both sides a little pubescent, the veins raised. Flowers in lax racemes, which exceed the leaves. Calyx $\frac{1}{2}$ in. long, densely ferruginous, the teeth linear-setaceous, reaching down nearly to the base. Corolla equalling the calyx; standard yellow, veined with purple, not silky, the keel obtuse. Pod not seen.

Nile Land. Abyssinia, *Petit!*

15. **R. viscosa,** *DC. Prod.* ii. 387. Stems woody, wide-twining, terete, finely glandular and grey-pubescent. Stipules ovate, persistent, scarious, $\frac{1}{2}$ in. long. Petioles $1\frac{1}{2}$–2 in. long, clothed like the branches; leaflets 3, central suborbicular or broadly ovate-rhomboidal, acute; petiolule $\frac{1}{2}$–$\frac{3}{4}$ in. long, lateral ones unequal-sided, under surface thinly pubescent. Flowers in lax racemes sometimes 6 in. long on short firm peduncles. Bracts ovate, deciduous. Calyx $\frac{3}{8}$–$\frac{1}{2}$ in. deep, grey-pubescent and glandular, cut down nearly to the base, the teeth lanceolate, the lowest much longer than the others. Corolla equalling or slightly exceeding the calyx, the standard pubescent on the back. Pod 1–$1\frac{1}{4}$ in. long, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, densely clothed with glands and spreading hairs when young, tipped with the persistent filiform style.—*Dolichos glutinosus*, Roxb. Fl. Ind. iii. 312; Wight. et Arn. Prod. Fl. Pen. Ind. Or. 248. *R. stipulosa*, A. Rich. Fl. Abyss. i. 229, t. 43.

Nile Land. Nubia, *Petherick! Binder.* Abyssinia, *Quartin-Dillon!* Karaguè and Unyoro, *Speke and Grant!*

A plant of the Mascarene isles and East Indies.

16. **R. debilis,** *Hook. f. Fl. Nigr.* 312. Stems firm-herbaceous, slender, climbing, grey-pubescent. Stipules small, lanceolate acuminate. Petioles 2–3 in. long, slender, firm; leaflets 3, central one broadly ovate-rhomboidal, 2–3 in. each way, cuspidate; petiolule $\frac{1}{2}$ in. long; lateral ones unequal-sided; texture thin, firm, both sides glabrescent. Flowers in dense subsessile heads 1–$1\frac{1}{2}$ in. long. Bracts linear-lanceolate, exceeding the pedicels, which are a line long. Calyx $\frac{1}{4}$ in. deep, grey-pubescent, the teeth linear-setaceous. reaching down nearly to the base. Corolla reddish, $\frac{3}{8}$ in. deep. Pod $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{4}$ in. broad, rather narrowed at both ends, thinly clothed with long spreading grey hairs.—*Dolichos debilis*, Don. mss.

Upper Guinea. Island of St. Thomas, *G. Don!* Cameroon mountains and banks of the Gaboon, *Mann!*

This has entirely the habit of *R. densiflora*, differing in the calyx and bracts.

17. **R. densiflora,** *DC. Prod.* ii. 389. Stems slender, firm-herbaceous, wide-twining, finely grey-pubescent. Stipules ovate or lanceolate. Petioles 1–$1\frac{1}{2}$ in. long, slender, finely pubescent; leaflets 3, central one broadly ovate acuminate, $1\frac{1}{2}$ in. each way; petiolule $\frac{3}{8}$–$\frac{1}{2}$ in. long, lateral ones unequal-sided, papyraceous, under surface slightly grey pubescent. Flowers in dense oblong subsessile clusters 2–4 in.

long. Bracts lanceolate, $\frac{3}{8}$ in. long, densely ciliated. Pedicels a line long. Calyx $\frac{3}{8}$–$\frac{1}{2}$ in. deep, grey-pubescent, teeth linear-setaceous, reaching down nearly to the base. Corolla reddish, scarcely exceeding the calyx. Pod $\frac{1}{2}$–$\frac{5}{8}$ in. long, $\frac{1}{4}$ in. broad, rather narrowed at both ends, finely grey-pubescent.—Wight et Arn. Prod. Fl. Pen. Ind. Or. 239. *Desmodium punctatum*, DC. Prod. ii. 338.

Mozamb. Distr. Zambesi land, banks of the Shire, *Dr. Kirk! Dr. Stewart!*
Also a plant of the East Indies.

18. **R. Grantii,** *Baker*. Stems firm, herbaceous, twining, adpressed grey-silky. Stipules minute, setaceous, reflexed. Petioles $\frac{1}{4}$–$\frac{1}{2}$ in. long; leaflets 3, central one oblanceolate, 3 in. long, $\frac{3}{8}$–$\frac{1}{2}$ in. broad, blunt or subacute; petiolule $\frac{1}{4}$ in. long; lateral ones equal-sided, texture firm, both sides grey-green, lower finely grey-silky on the veins. Flowers 1 or 2 together, nearly sessile in the axils of the leaves. Calyx 2 lines deep, upper teeth connate, lower linear, reaching more than halfway down. Pod oblong $\frac{1}{2}$–$\frac{5}{8}$ in. long, 2-seeded, the valves nearly flat, densely clothed with spreading grey bristly hairs.

Nile Land. Grassy plateaux of Unyoro, *Speke and Grant!*
In general habit closely resembling *Dolichos biflorus*.

A very curious plant (*R? antennulifera*, Baker), gathered by Dr. Meller in Zambesi land, has the ovary and stamens of this genus, but the leaves are unknown, and the habit is entirely different from that of any known species. The racemes are from six inches to more than a foot long, and arise singly or two or three together from a straight terete woody glabrous stem. The axis of the stem is woody in the lower part, straight, and clothed with grey pubescence. The flowers extend nearly or quite to the base, the lower ones in lax fascicles of three or four together, the upper crowded. The bracteoles are linear, $\frac{1}{4}$ in. long, with a long filiform point thickened upwards. The calyx is distinctly stalked, $\frac{5}{8}$–$\frac{3}{4}$ in. long, cleft three quarters of the way down, densely clothed with firm ascending grey hairs on the outside, the two upper teeth slightly connate, the three lower ones lanceolate in the lower part, but the points still more distinctly lengthened out than those of the bracts into a filiform awn, thickened towards the apex so as to resemble closely the antenna of an insect. The corolla appears to be dull yellow, and distinctly exceeds the calyx, the standard being oblong, $3\frac{1}{2}$–4 lines broad, and the wings under 2 lines broad, both about equalling the keel.

71. **ERIOSEMA,** DC.; Benth. et Hook. f. Gen. Plant. i. 543.

Calyx-teeth subequal or the two upper ones slightly connate. Standard oblong or obovate, appendiculate at the base with inflexed auricles; wings narrow; keel slightly incurved at the apex, obtuse. Upper stamen free, the others connate; anthers uniform. Ovary sessile, 2-ovulate; style filiform or slightly thickened upwards; stigma small, terminal. Pod compressed, obliquely orbicular, rhomboidal or broad-oblong, 2-valved, continuous within. Seeds 2 or by abortion 1.—Herbs or shrubs with pinnately trifoliolate or simple leaves, the stems not twining in any of the Tropical African species.

A genus of moderate size, almost confined to South America, Tropical Africa, and the Cape.

Stems herbaceous, very short.
Leaves simple . . . . . 1. *E. cordifolium*.

Leaves trifoliolate.
Leaves subsessile. Root fleshy . . . . . 2. *E. tuberosum.*
Leaves stalked. Root wiry . . . . . 3. *E. pygmæum.*
Stems herbaceous elongated. Leaves simple . . . . . 4. *E. Afzelii.*
Shrubs woody at the base only.
Calyx 1–1½ lines long, less than half the corolla.
Leaves subsessile . . . . . 5. *E. polystachyum.*
Leaves distinctly stalked . . . . . 6. *E. parviflorum.*
Calyx 2–3 lines long, at least half the corolla.
Leaves subsessile.
Peduncles about an inch long . . . . . 7. *E. sericeum.*
Peduncles 3–5 in. long . . . . . 8. *E. pauciflorum.*
Leaves distinctly stalked.
Peduncles equalling the leaves . . . . . 9. *E. radicosum.*
Peduncles twice the leaves . . . . . 10. *E. longepedunculatum.*
Shrubs with woody branches.
Leaves simple . . . . . 11. *E. ellipticum.*
Leaves trifoliolate.
Leaves subsessile.
Flowers in elongated stalked racemes . . . . . 12. *E. cajanoides.*
Flowers in subsessile congested heads.
Pod equalling the calyx . . . . . 13. *E. griseum.*
Pod twice the calyx . . . . . 14. *E. glomeratum.*
Leaves distinctly stalked.
Corolla slightly exceeding the calyx.
Stipules linear-lanceolate, 2 lines . . . . . 15. *E. Muxiria.*
Stipules ovate-lanceolate, 6–9 lines . . . . . 16. *E. robustum.*
Corolla twice the calyx . . . . . 17. *E. flemingioides.*
Corolla thrice the calyx . . . . . 18. *E. speciosum.*

1. **E. cordifolium,** *Hochst. in Schimp. Herb. Abyss.* No. 1542. Root fusiform or napiform. Stem a foot or more high, branched from the base, firm-herbaceous, diffuse slightly pubescent. Stipules small, lanceolate, scarious. Leaves simple, subsessile, cordate-ovate, 2–3 in. long, broad, acute or bluntish, base with two deep rounded lobes, firm, both sides green, slightly pubescent. Flowers in dense rounded or oblong heads an inch deep on peduncles under an inch long, which are densely clothed with spreading grey hairs. Pedicels very short. Calyx ¼ in. deep, clothed with spreading tawny hairs, the teeth linear-setaceous, densely ciliated, reaching three-quarters of the way down. Corolla yellow, slightly exceeding the calyx. Pod 3–4 lines long by nearly as broad, thinly clothed with spreading tawny hairs.—A. Rich. Fl. Abyss. i. 227.

Nile Land. Abyssinia, *Schimper!* and others.

2. **E. tuberosum,** *Hochst. in Schimp. Pl. Abyss.* No. 1624. Root fusiform or napiform. Stipules lanceolate, scarious, striated, ¼–⅜ in. deep. Stem suberect, simple, under a foot high, densely grey-silky upwards. Leaves subsessile; leaflets 3, oblong-lanceolate or narrowly obovate, 2–3 in. long, both ends narrowed; the petiolule under ¼ in. long, upper surface grey-green, soon glabrous, lower permanently matted with fine grey-silky pubescence. Flowers in dense rounded heads an inch deep on short silky peduncles. Pedicels very short. Calyx ¼ in. deep, densely grey-silky, teeth lanceolate acuminate, not

reaching halfway down. Corolla yellow, half as long again as the calyx. Pod densely grey-silky, $\frac{3}{8}$ in. long by $\frac{1}{4}$ in. broad.—A. Rich. Fl. Abyss. i. 227. *Rhynchosia tuberosa*, Hochst. in Schimp. Hb. Abyss. No. 1202.

Nile Land. Abyssinia, *Schimper!*

3. **E. pygmæum,** *Welw. mss.* A perennial with a woody rootstock, and cæspitose branched herbaceous densely grey-silky stems, not more than $1\frac{1}{2}$–2 in. high. Stipules linear, $1\frac{1}{2}$–2 lines, persistent. Petioles $\frac{1}{8}$–$\frac{1}{4}$ in.; leaflets 3, lanceolate acute, both sides persistently grey-canescent, edge rather decurved, veins below raised; end leaflet 8–9 lines long; petiolule 1 line; lateral ones smaller not unequal-sided. Flowers in pairs on an erecto-patent axillary peduncle $\frac{3}{8}$–$\frac{1}{2}$ in. long. Pedicels very short. Calyx $\frac{1}{4}$ in., densely grey-silky, teeth linear-lanceolate, exceeding the tube. Corolla reddish, twice the calyx. Pod round, 4 lines each way, finely grey-silky.

Lower Guinea. Highlands of Huilla, 4000 feet, *Dr. Welwitsch!*

4. **E. Afzelii,** *Baker.* Stem herbaceous, 2–3 ft. high, erect, stout, densely clothed with grey woolly pubescence. Stipules lanceolate, $\frac{3}{4}$–1 in. long, pubescent. Leaves simple, sessile, lanceolate, the lowest 6 in. long by over an inch broad, narrowed gradually from below the centre to both ends, subcoriaceous, glabrous above, densely matted with grey pubescence beneath. Flowers in a dense terminal head 3–6 in. long. Calyx $\frac{1}{8}$ in. long; teeth deltoid, not reaching more than a quarter of the way down. Corolla reddish, three times the length of the calyx. Pod 4–5 lines long, 2 lines broad, with a distinct stalk equalling the calyx, densely clothed with long tawny silky hairs. —*Rhynchosia Afzelii*, R. Br. in herb. Brit. Mus.

Upper Guinea. Sierra Leone, *Afzelius!*
A very distinct species.

5. **E. polystachyum,** *Baker.* Stems 2–3 ft. high, suberect, woody below, densely clothed with spreading light ferruginous pubescence. Stipules lanceolate, $\frac{1}{4}$ in. long. Leaves nearly sessile; leaflets 3, central one ovate-lanceolate, 2–3 in. long, acute; petiolule $\frac{1}{4}$ in. long; lateral ones rather unequal-sided, upper side finely pubescent at first, lower thinly pubescent, the veins raised and ferruginous. Flowers in dense racemes 2–3 in. long on pubescent peduncles as long. Bracteoles minute, setaceous. Pedicels very short. Calyx $\frac{1}{8}$ in. deep, thinly-silky; teeth lanceolate, reaching halfway down. Corolla more than twice the calyx. Pod $\frac{1}{2}$ in. long by half as broad, the point oblique, the faces densely clothed with long tawny silky hairs.—*Rhynchosia polystachya*, A. Rich. Fl. Abyss. i. 231, t. 44.

Nile Land. Abyssinia, *Schimper! Petit.*

6. **E. parviflorum,** *E. Meyer, Comm. Pl. Afr. Austr.* 130. Stems 2–3 ft. high, suberect, woody below, copiously branched, densely

clothed with spreading or deflexed tawny silky hairs. Stipules 3–4 lines long, linear or lanceolate, often deflexed. Petioles ½–1 in. long; leaflets 3, central one oblong or slightly ovate, 2–3 in. long, blunt or acute; petiolule ¼ in. long, the lateral ones unequal-sided, under surface downy all over, the veins raised and ferruginous. Flowers in dense heads 1–2 in. long on glabrous or pubescent peduncles 4–10 in. long. Bracts lanceolate-setaceous, deciduous. Pedicels very short. Calyx slightly pilose, a line deep; teeth deltoid or lanceolate, not reaching halfway down. Corolla three times the calyx, yellow tipped with red. Pod ½ in. long, ¼ in. broad, densely clothed with long tawny silky hairs.—*E. podostachyum* and *spicatum*, Hook. f. Fl. Nigr. 314. *Cytisus glomeratus*, Bojer, Hort. Maur. 89 (name only). *E. consanguineum*, Klotzsch in Peters' Mossamb. Bot. 33.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Don! Afzelius!* Guinea proper, *Vogel! Ansell!* and others.
Nile Land. Karaguè, *Speke and Grant*, 420!
Mozamb. Distr. Island of Zanzibar, *Bojer! Peters!*
Extends southwards to the Cape.

7. **E. sericeum,** *Baker*. Branches firm, herbaceous, moderately stout, densely clothed with erecto-patent bright brown silky hairs. Stipules linear, ½ in. long, scarious, erect. Leaves subsessile; leaflets 3, central one oblong-lanceolate, 3–4 in. long, both ends narrowed gradually; petiolule ¼ in. long, lateral ones erecto-patent, equal-sided, both sides glabrous except that the raised veins beneath are clothed with fine bright ferruginous pubescence. Flowers in dense rounded heads an inch each way on firm silky peduncles an inch long. Bracts ovate-lanceolate, exceeding the silky pedicel, which is ⅛ in. long. Calyx ¼ in. deep, densely brown-silky; teeth linear-setaceous, densely ciliated, reaching three-quarters down. Pod broad-oblong, oblique at the point, densely clothed with long brown silky hairs.

Upper Guinea. Angiama, Niger country, *Barter!*

8. **E. pauciflorum,** *Klotzsch in Peters' Mossamb. Bot.* i. 31. Stems a foot or more high, suberect, the branches firm-herbaceous, slender, densely clothed with spreading ferruginous pubescence. Stipules ¼ in. long, lanceolate, scarious. Leaves nearly sessile; central leaflet oblanceolate, 1½ in. long, blunt; petiolule ¼ in. long; lateral ones erecto-patent, scarcely unequal-sided, subcoriaceous, upper surface glabrescent, lower finely grey-downy all over, the veins raised, ferruginous. Flowers 6–8 in moderately dense racemose heads, on firm pubescent peduncles 3–5 in. long. Bracts lanceolate, shorter than the calyx, deciduous. Pedicels very short. Calyx ¼–⅜ in. deep, finely grey-silky; teeth lanceolate-setaceous, reaching halfway down, densely ciliated. Corolla half an inch deep. Pod not seen.

Mozamb. Distr. Zambesi land, Sena, *Dr. Peters!*

9. **E. radicosum,** *A. Rich. Fl. Abyss.* i. 228. Stems 1–2 ft. high, woody below, the branches flexuous, densely clothed with tawny hairs.

Stipules linear, densely silky. Leaves stalked, trifoliolate; central leaflet oblong, acute; lateral ones slightly unequal-sided, under surface principally pilose. Flowers in 8–12-flowered racemes, on peduncles which equal the leaves. Calyx densely tawny-silky; teeth subdeltoid. Corolla twice the calyx. Pods oblong, silky.

Nile Land. Abyssinia, *Quartin-Dillon.*
Not seen.

10. **E. longepedunculatum,** *A. Rich. Fl. Abyss.* i. 226. Stems a foot or more high, suberect, the branches firm-herbaceous, terete, slender, clothed with fine tawny down. Stipules $\frac{1}{4}$ in. long, lanceolate, scarious. Petioles $\frac{1}{2}$–1 in. long, slender, firm. Leaflets 3, central one ovate or oblong, 1–$1\frac{1}{2}$ in. long; petiolule 2 lines long; lateral ones unequal-sided, subcoriaceous, the under surface slightly pubescent on the raised ferruginous veins. Flowers in moderately dense 6–12-flowered racemes 1–$1\frac{1}{2}$ in. long, on slender, firm, glabrous peduncles 3–4 in. long. Bracts linear, deciduous, $\frac{1}{4}$ in. long, ferruginous. Calyx 2 lines deep, finely adpressed-silky; teeth lanceolate, reaching a third down. Corolla twice the calyx. Pod $\frac{1}{2}$ in. long by more than $\frac{1}{4}$ in. broad, the apex oblique, the valves finely tawny-silky.—*Rhynchosia longepedunculata,* Hochst. in Schimp. Hb. Abyss. No. 925.

Nile Land. Abyssinia, *Schimper!*
Resembles *E. parviflorum* in general habit, but the calyx twice as long.

11. **E. ellipticum,** *Welw. mss.* A sparingly branched shrub 2–3 ft. high, with rigid sulcate grey-canescent branches. Stipules minute lanceolate, deciduous. Petioles rigidly erecto-patent, $\frac{1}{8}$–$\frac{1}{4}$ in. Leaves simple, rigidly coriaceous, oblong, blunt, rounded at the base, 2–$2\frac{1}{2}$ in. long, dull green with immersed glands and short inconspicuous hairs above, closely persistently grey-canescent below. Flowers in copious subsessile congested axillary racemes much shorter than the leaves. Pedicels 1–$1\frac{1}{2}$ lines, densely grey-silky. Calyx 2 lines, campanulate, densely silky; teeth deltoid, much shorter than the tube. Corolla yellow, 6–7 lines; standard densely silky on the back. Pod oblong, $\frac{3}{4}$–$\frac{7}{8}$ in. long, $\frac{1}{2}$ in. broad, densely grey-silky.

Lower Guinea. Highlands of Huilla, at 4000 feet, *Dr. Welwitsch!*

12. **E. cajanoides,** *Hook. f. Fl. Nigr.* 314. An erect copiously branched shrub, 4–5 ft. high, branches slender, angular, densely adpressed grey-silky. Stipules minute, lanceolate. Petioles $\frac{1}{8}$–$\frac{1}{4}$ in. long. Leaflets 3, central one oblanceolate or narrow-oblong, 2–3 in. long, blunt or acute; petiolule $\frac{1}{4}$–$\frac{1}{2}$ in. long; lateral ones erecto-patent, scarcely unequal-sided, subcoriaceous, under surface grey-green, glabrescent, lower densely and permanently coated with fine grey pubescence. Flowers in moderately close racemes 2–4 in. long, on firm peduncles 1–2 in. long. Pedicels very short. Calyx 2–$2\frac{1}{2}$ lines deep, finely silky; teeth subdeltoid, reaching nearly half down. Corolla yellow, twice the calyx. Pod over half an inch long by rather less broad, the

point oblique, the faces thinly clothed with long grey silky hairs.—Harv. Fl. Cap. ii. 261. *Rhynchosia cajanoides*, Guill. et Perr. Fl. Seneg. 215. *E. polystachyum*, E. Meyer, Comm. Pl. Afr. Austr. 130. *E. floribundum*, *macrophyllum* and *incanum*, Klotzsch in Peters' Mossamb. Bot. 33-4.

Upper Guinea. Senegambia, *Leprieur and Perrottet! Heudelot!* Sierra Leone, *Smeathmann!* Guinea proper, *Barter! Irving! Brass!*
Nile Land. Nubia; Noer, *Binder* (*fide Kotschy*).
Lower Guinea. Congo, *Capt. Burton!* Highlands of Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Peters! Dr. Meller! Dr. Kirk!*
Extends southward to Natal.

13. **E. griseum,** *Baker*. A low copiously branched shrub, with firm woody slender branches, densely clothed with grey pubescence. Stipules $\frac{1}{4}$ in. long, lanceolate, scarious. Petioles $\frac{1}{8}$ in. long; leaflets 3, the central one oblanceolate, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long by about $\frac{3}{8}$ in. broad, acute or blunt; the petiolule $\frac{1}{8}$ in. long, the lateral ones erecto-patent, slightly unequal-sided, subcoriaceous, upper surface grey-green, finely downy, lower softly grey-downy all over. Flowers in dense rounded heads an inch or more each way on firm short downy peduncles. Bracts lanceolate acuminate, grey-silky, $\frac{3}{8}$–$\frac{1}{2}$ in. long. Pedicels a line long. Calyx half an inch deep, finally membranous, clothed with spreading grey hairs, the teeth linear or lanceolate, densely ciliated, reaching three-quarters of the way down. Corolla yellow. Pod oblong, equalling the calyx, the valves finely downy.

Upper Guinea. Aboh and lofty hills of the Yomba country, *Barter!*
Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

14. **E. glomeratum,** *Hook. f. Fl. Nigr.* 313. An erect copiously branched shrub, 5–6 ft. high, with slender woody branches more or less densely clothed with spreading ferruginous pubescence. Stipules lanceolate, scarious, $\frac{1}{4}$ in. long. Leaves subsessile; leaflets 3, the central one oblong-lanceolate, 2–3 in. long, narrowed to both ends; petiolule $\frac{1}{8}$ in. long; lateral ones erecto-patent, slightly unequal-sided, subcoriaceous, upper surface grey-green, finely downy when young, lower finely grey-downy all over, the raised veins ferruginous. Flowers crowded in dense nearly sessile axillary heads an inch or less broad and long. Bracts linear, $\frac{1}{4}$ in. long. Pedicel a line long. Calyx $\frac{1}{4}$ in. deep, densely silky, the teeth linear-setaceous, densely ciliated, reaching half down. Corolla bright yellow, twice the calyx. Pod broad-oblong, $\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad, densely clothed with long silky hairs.—*Glycine rufa*, Schum. et Thonn. Pl. Guin. 344, non H. B. K. *Rhynchosia glomerata*, Guill. et Perr. Fl. Seneg. 216. *E. rufum*, Baill. in Adans. vi. 226, non E. Meyer. *E. gracile*, Klotzsch in Peters' Mossamb. Bot. 35.

Upper Guinea. Sierra Leone, *Afzelius! Smeathmann!* Senegambia, *Heudelot! Perrottet!* Guinea proper, *Thonning, Vogel! Barter! Mann! Griffon du Bally. Brass! Duparquet.*
Lower Guinea. Congo, *Capt. Burton!* Highlands of Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zanzibar, *Dr. Peters!*

Var. β. *E. elongatum*, Baillon in Adans. vi. 227 (ad not.). Internodes 4 in. long; clusters about 10-flowered on a peduncle nearly an inch long.

Upper Guinea. Senegambia, *Heudelot!*

15. **E. Muxiria,** *Welw. mss.* An erect shrub, with branches clothed with dense short grey persistent pubescence. Stipules linear-lanceolate, 2 lines. Petioles erecto-patent, 1½–2 in.; leaflets 3, subcoriaceous, green and shining above, persistently matted below with adpressed grey pubescence; petiolule ⅜–⅝ in.; end one ovate-rhomboidal, almost cordate, blunt with a mucro, 2½–3½ in. long; lateral ones very unequal-sided. Flowers in short-stalked moderately dense terminal racemes 3–4 in. long. Bracts lanceolate, silky, subpersistent. Pedicels 1½–2 lines. Calyx ½–⅝ in., densely clothed with long spreading grey silky hairs, with a pair of setaceous bracteoles at the base, the lanceolate acuminate teeth much exceeding the tube. Corolla slightly exceeding the calyx, variegated with violet and yellow, sometimes almost blue. Pod densely brown-velvety, not seen mature.—*Muxiria utilis*, Welw. Apont. 575.

Lower Guinea. Angola, sometimes cultivated, *Dr. Welwitsch!*

16. **E. robustum,** *Baker.* A bush with moderately stout woody branches densely clothed with ferruginous pubescence. Stipules broad-ovate, scarious, reflexed, ½–¾ in. long. Petioles an inch long, firm, woody, ferruginous-pubescent; leaflets 3, central one ovate, 5–6 in. long, narrowed gradually to a point, coriaceous, upper surface finely downy, lower densely downy all over, the veins raised and ferruginous. Flowers in a terminal panicle and dense short-stalked axillary racemes. Bracts broad-ovate, ½ in. deep, brown, membranous, finely ferruginous-silky. Pedicel a line long. Calyx half an inch deep, densely clothed with long ferruginous silky hairs, the upper teeth lanceolate, reaching about half down, the lowest longer and narrower than the rest. Corolla slightly exceeding the calyx. Pod not seen.

Nile Land. Abyssinia, *Parkyns!*

In its leaves and general habit this resembles the next, but the flowers are very different.

17. **E. flemingioides,** *Baker.* A bush with moderately woody flexuose branches densely clothed with fine yellowish-grey or ferruginous down. Stipules ovate, scarious, silky ⅜–½ in. deep. Petioles 1¼–1½ in. long, woody, clothed like the stem; leaflets 3; central one oblong 4–5 in. long, 2½–3 in. broad, acute, rounded at both ends, petiolule ½ in. long, lateral ones spreading, scarcely unequal-sided, coriaceous, upper surface finely downy at first, lower grey-downy all over, the raised veins and veinlets bright ferruginous. Flowers in short-stalked moderately dense racemes 2–3 in. long. Bracts and bracteoles ovate acuminate, ⅜–½ in. long, scarious, with pale ferruginous silky hairs, subpersistent, the unexpanded heads forming a cone with bracts only visible. Rachis very zigzag. Pedicels very short. Calyx under ¼ in. deep, grey-silky; teeth lanceolate, reaching half down. Corolla ½–⅝ in. deep, the stan-

dard deep red, $\frac{3}{8}$ in. broad, the keel pale. Pod $\frac{5}{8}$–$\frac{3}{4}$ in. long, $\frac{3}{8}$ in. broad, thickly clothed with long tawny silky hairs.

Nile Land. Madi, *Speke and Grant!*

This and its two neighbours resemble closely the common East Indian *Flemingiæ* in general habit, but the central leaflet is stalked and the pod just that of *Eriosema*.

18. **E. speciosum,** *Welw. mss.* An erect shrub 2–4 ft. high with firm densely grey-downy branches. Stipules $\frac{3}{8}$–$\frac{1}{2}$ in., ovate-lanceolate, subpersistent. Petioles $\frac{1}{2}$–1 in.; leaflets 3, subcoriaceous, dull green, glabrescent above, finely downy with raised veins below, end one oblong-lanceolate acute reaching 3–4 in. long; petiolule $\frac{1}{8}$–$\frac{1}{4}$ in.; lateral ones erecto-patent equal-sided. Flowers in close casually forked short-stalked terminal racemes 3–6 in. long. Bracts 3–4 lines, lanceolate cuspidate, very silky. Pedicels very short. Calyx 3$\frac{1}{2}$–4 lines, finely silky, teeth lanceolate, exceeding the tube. Corolla $\frac{3}{4}$–$\frac{7}{8}$ in., yellow; standard oblong-spathulate, $\frac{3}{8}$ in. broad, keel violet. Pod oblong, 6–7 lines long, $\frac{3}{8}$ in. broad, clothed with spreading tawny silky hairs.

Lower Guinea. Huilla, *Dr. Welwitsch!*

Very near *E. flemingioides*, from which it differs mainly by its larger flowers and narrower leaflets.

72. **FLEMINGIA,** Roxb.; Benth. et Hook. f. Gen. Plant. i. 544.

Calyx-teeth subequal or the lowest longer. Standard obovate or orbicular, the base appendiculate with inflexed auricles; wings obliquely obovate or oblong, often adhering to the keel; keel incurved or nearly straight, obtuse or acute. Upper stamen free, the others connate; anthers uniform. Ovary subsessile, short, biovulate; style filiform or slightly incrassated above; stigma small, terminal. Pod short, oblique, turgid, two-valved, continuous within.—Erect or prostrate shrubs.

A moderately small genus, belonging principally to Tropical Asia.

Leaves simple.
- Flowers solitary . . . . . 1. *F. faginea.*
- Flowers in short-stalked clusters . . . . . 2. *F. oblongifolia.*

Leaves digitately trifoliolate. . . . . 3. *F. rhodocarpa.*

1. **F. faginea,** *Baker.* An erect shrub with woody subterete chestnut-brown slender branches clothed upwards with short dense grey pubescence. Stipules small, lanceolate, deciduous. Petioles $\frac{1}{4}$–$\frac{3}{4}$ in. long, firm, grey-pubescent; leaves simple, rotundato-cordate, 2 in. each way, bluntish, subcoriaceous, both sides finely grey-silky when young. Flowers solitary, or casually in pairs from the axils of the leaves on silky pedicels $\frac{1}{8}$ in. long. Calyx $\frac{1}{4}$ in. deep, finely grey-silky, the teeth lanceolate, reaching half down. Corolla red, scarcely exceeding the calyx. Pod oblique-oblong, turgid, finely villous.—*Rhynchosia,* Guill. et Perr. Fl. Seneg. 212, t. 52.

Upper Guinea. Senegambia, *Leprieur and Perrottet!*

2. **F. oblongifolia,** *Baker.* An erect copiously branched shrub 4–5 ft. high with firm woody slender angular finely grey-pubescent

branches. Stipules small, deciduous. Petioles $\frac{1}{4}$ in. long, firm, erecto-patent; leaves simple, oblong, $1\frac{1}{2}$–2 in. long, bluntish, coriaceous, upper surface glabrous, the lower finely grey-silky all over. Flowers in subcapitate clusters of 2–6 on a woody peduncle $\frac{1}{2}$ in. or less long. Calyx campanulate, $\frac{1}{4}$ in. deep, slightly silky, the upper teeth deltoid, the lowest the longest. Corolla not seen. Pod oblong 1 in. long, $\frac{3}{8}$ in. broad, finely grey-pubescent, the point somewhat oblique, the valves firm, turgid, not at all constricted.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

3. **F. rhodocarpa,** *Baker.* A bush with woody moderately slender finely grey-silky branches. Stipules lanceolate, scarious, silky, $\frac{3}{8}$ in. long. Lower petioles $1\frac{1}{2}$ in. long, firm, woody, finely silky when young; leaflets 3, oblong-lanceolate; terminal one sessile, 3–4 in. long by less than half as broad, pointed, the base subcuneate, subcoriaceous, upper surface slightly grey-silky when young, lower more densely and permanently silky all over, the veins raised. Flowers in dense capitate axillary clusters. Bracts imbricated in bud. Pedicels 1–$1\frac{1}{2}$ lines long. Calyx $\frac{1}{4}$ in. deep, thinly silky; teeth setaceous, reaching three-quarters of the way down. Corolla reddish, equalling the calyx. Pod oblong, $\frac{1}{2}$ in. deep, $\frac{1}{4}$ in. broad, apex truncate, the valves horny and turgid, covered with a bright red gummy or resinous exudation.

Mozamb. Distr. Manganya hills, Zambesi land, *Dr. Meller!*

This comes near the East Indian *F. Grahamiana* and *Wallichii.* G. Don (Gard. Dict. ii. 309) describes a *F. guineensis,* from Sierra Leone, with five obovate obtuse leaflets, stipules about the size of the side leaflets, and flowers in axillary racemes, with large round striated bracts, of which we know nothing.

73. DALBERGIA, Linn.; Benth. et Hook. f. Gen. Plant. i. 544.

Calyx with the two upper teeth the broadest, the lowest often the longest. Standard ovate or orbicular; wings oblong; keel obtuse, its petals connate upwards. Stamens all connate in a sheath split above, or the upper one free or absent, or the sheath also split below so that they form two bundles; anthers small, erect, didymous, their cells placed back to back, opening by a small apical or rarely by a longitudinal slit. Ovary stalked, pauciovulate; style incurved short; stigma small, terminal. Pod samaroid, oblong, rarely falcate, generally flat, thin, always indehiscent, in all our species usually only one-seeded.—Trees or wide-climbing shrubs.

A large genus, dispersed throughout the Tropics. Mr. Bentham has monographed all the known species of this and the other genera of the tribe *Dalbergieæ* in the Supplement to the fourth volume of the Journal of the Linnean Society.

Stamens all connate or pod reticulated against the seed.
- Spinose . . . . . 1. *D. hostilis.*
- Unarmed.
  - Branches densely ferruginous; leaflets 21–33 . . . . 2. *D. multijuga.*
  - Branches nearly glabrous; leaflets 11–13 . . . . . 3. *D. arbutifolia.*

Stamens in two sets of five each. Pods smooth.
- Leaves simple . . . . . 4. *D. malifolia.*

Leaves compound.
Flowers in copious terminal as well as axillary panicles.
An erect bush, with strong spines . . . . . 5. *D. melanoxylon.*
Unarmed climbers.
Branches glabrous; leaflets 9–11.
Leaflets obovate-oblong, blunt, often retuse . . . 6. *D. saxatilis.*
Leaflets ovate, narrowed from the middle to an acute point . . . . . 7. *D. bracteolata.*
Branches pubescent; leaflets 11–21. . . . . 8. *D. pubescens.*
Flowers in congested axillary panicles.
Leaflets 15–19, glabrous . . . . . 9. *D. Afzelii.*
Leaflets 11–13, velvety beneath . . . . . 10. *D. nitidula.*
Leaflets 5–7.
Leaflets glabrous beneath . . . . . 11. *D. Bakeri.*
Leaflets velvety beneath . . . . . 12. *D. macrosperma.*

1. **D. hostilis,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 33. A wide-climbing or occasionally erect bush with a complanate woody trunk half a foot broad by an inch thick with strong spines in stellate clusters. Branches woody, glabrous, thickly armed with spines $\frac{1}{2}$–1 in. long. Petiole under an inch long; leaves 3–4 in. long with 15–19 early deciduous glabrous obovate-oblong leaflets 9–15 lines long, opaque on both sides, glaucous below, on petiolules a line long. Flowers in irregular elongated terminal thyrsoid panicles with dense cymose branches glabrous below. Branchlets finely grey-velvety. Pedicels almost obsolete. Calyx campanulate, $\frac{3}{4}$ line deep, with deltoid teeth. Corolla whitish, inconspicuous, twice the calyx. Stamens in a single bundle. Pod 1–2-seeded, membranous, 2–3 in. long, $\frac{1}{2}$ in. broad, not reticulated against the seeds, narrowed to both ends, below to a very slender pedicel 3–4 lines long.

Upper Guinea. Abeokuta, *Dr. Irving!*
Lower Guinea. Angola, *Dr. Welwitsch!*

2. **D. multijuga,** *E. Meyer, Comm.* 153. A low bush with woody unarmed finely velvety branchlets. Petioles 6–9 lines long; leaves 4–5 in. long, with 21–33 oblong leaflets, $\frac{1}{2}$–$\frac{5}{8}$ in. long by about half as broad, shortly pointed, densely velvety below when young, on very short petiolules. Flowers in copious sessile axillary panicles or racemes shorter than the leaves. Pedicels ferruginous, $1\frac{1}{2}$–2 lines long. Calyx obconical, 2 lines deep, thinly velvety, the deltoid teeth reaching a third of the way down. Corolla bright orange, half as long again as the calyx, the keel and wings both rather shorter than the standard, the claws much shorter than the calyx. Ovary linear, silky, long-stalked. Pod (of Natal plant) 2 in. long, 8–9 lines broad, narrowed to both ends.

Mozamb. Distr. Zambesi land, *Dr. Kirk! Dr. Meller!*
Also Natal.

3. **D. arbutifolia,** *Baker.* Branches woody, not spinose, the young ones clothed with fine ferruginous pubescence. Petioles firm, under an inch long, pubescent like the branches; rachis 3–4 in. long; leaflets 11–13, oblong, $1\frac{1}{4}$ in. long, both ends rounded, the edges decurved,

subcoriaceous, both sides grey-green, the main veins beneath prominent, the midrib beneath pubescent. Flowers not seen. Pod 2–2½ in. long, 1¼ in. broad, rigid, quite glabrous, both ends narrowed, blunt or subacute, the middle raised on both sides and the reticulations deep and excavated.

Mozamb. Distr. Zambesi land, *Dr. Kirk!*

Another Zambesi land species, of which we do not possess the flowers, has leaflets like this in number and shape, but glabrous like the rachis and branches, the pod longer and narrower (about 3 in. long by ¾ in. broad), blunt, the base narrowed to a long stalk, the seed prominent on one side with copious raised veins, excavated on the other.

4. **D. malifolia,** *Welw. mss.* An erect tree 20–25 ft. high with the habit of *Pyrus Malus*, with glabrous woody branches. Petioles woody, 3–4 lines long; leaves simple, oblong, rounded at the base, slightly pointed, 3–4½ in. long, 2–3 in. broad, subcoriaceous, opaque, glabrous. Flowers in dense congested sessile axillary panicles under 1 in. broad. Pedicels finely velvety, under a line long. Calyx campanulate, a line deep, the deltoid teeth not reaching more than a quarter of the way down. Corolla 3–3½ lines long, reddish-white, the keel shorter than the wings and orbicular reflexed standard. Stamens equally diadelphous. Ovary linear, with not more than 2 ovules, tapering into a long pedicel; style abruptly incurved. Pod not seen.

Upper Guinea. Prince's island, *Dr. Welwitsch!*

5. **D. melanoxylon,** *Guill. et Perr. Fl. Seneg.* 227, t. 53. A copiously branched bush or small tree, 15–20 ft. high, with stout woody glabrous branches, and long sharp woody spines. Petioles under ½ in., glabrous; leaflets 9–13, short-stalked, oblong or obovate, ½–¾ in. long, both ends rounded, often emarginate, subcoriaceous, both sides glabrous, veins beneath raised. Flowers in copious terminal and axillary panicles, the latter equalling or shorter than the leaves. Pedicels a line long, slender, glabrous, bracteolate. Calyx 2 lines deep, glabrous, upper teeth deltoid, the lowest lanceolate. Corolla yellow, slightly exceeding the calyx. Pod ¾–2 in. long, ½ in. broad, blunt or subacute, with a long pedicel, the valves glabrous and membranous. Seeds 1–4. —A. Rich. Fl. Abyss. i. 232; Benth. l.c. 47.

Upper Guinea. Senegambia, *Leprieur and Perrottet! Heudelot!*

Nile Land. Nubia, Sennaar and banks of the White Nile, *Kotschy! Cienkowsky,* and others. Abyssinia, *Schimper! Plowden! Quartin-Dillon.* Madi, *Speke and Grant!*

Mozamb. Distr. Mozambique, *Dr. Peters!* Zambesi land, *Dr. Kirk! Dr. Meller!*

"Met with from 5° S. to 5° N.; wood considered first class, being impervious to insects; very hard and heavy, with dull purple heart resembling rosewood when polished. Uses.—Arrow tips, wooden hammers for beating bark cloths, rafters; root a remedy for toothache."—*Col. Grant.*

6. **D. saxatilis,** *Hook. f. Fl. Nigr.* 314. A wide-climbing shrub many feet long, with dull grey glabrous branches. Stipules deciduous. Petioles 9–18 lines long; leaflets 9–11, on a rachis 3–5 in. long,

oblong or obovate-oblong, subcoriaceous, glabrous, blunt or often retuse, rounded at the base, the veins beneath slightly raised; the upper 1½–2 in. long. Flowers in copious subcorymbose axillary and terminal panicles, the former much shorter than the leaves. Pedicels ½–1 line long, subglabrous. Calyx ⅛ in. deep, subglabrous, the oblong-deltoid teeth reaching nearly halfway down. Corolla whitish or rose-coloured, twice the calyx. Pod 3–4 in. long, 12–15 lines broad, quite smooth, pedicellate.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius! Smeathmann! Don!* Niger land, *Ansell! Mann!*

7. **D. bracteolata,** *Baker.* A wide-climbing shrub with slender perfectly glabrous grey-dotted branches. Stipules linear-lanceolate, 4–5 lines long, deciduous. Petioles 6–12 lines long; leaflets 9–11, ovate, on a rachis 3–5 in. long, coriaceous, glabrous, narrowed gradually from the middle to an acute point, the veinlets beneath not raised. Flowers in copious subcorymbose terminal and axillary panicles. Bracteoles membranous, lanceolate, 1½–2 lines long, remaining till the flowers expand. Lower pedicels ⅛ in. long. Calyx campanulate, glabrous, ¾ line long, the teeth deltoid. Corolla twice the calyx. Pod pointed, 18–21 lines long, 6–7 lines broad, quite smooth, narrowed at the base into a pedicel quite half an inch long.

Mozamb. Distr. Zambesi land, and on the island of Zanzibar, *Dr. Kirk!*

8. **D. pubescens,** *Hook. f. Fl. Nigr.* 315. A wide-climbing shrub, with woody slender branchlets clothed with fine ferruginous pubescence. Petioles very short; rachis 3–8 in. long; leaflets 11–21, shortly-stalked, oblong, rounded at both ends, 1–2 in. long, 6–9 lines broad, coriaceous, the under surface finely pubescent with raised main-veins. Flowers in dense axillary and terminal panicles, the former much shorter than the leaves. Pedicels densely brown-velvety, ½ line long. Calyx ⅛ in. deep, finely pubescent, the teeth deltoid. Corolla reddish-yellow, becoming paler with age, ¼ in. long, the keel much shorter than the standard and wings. Stamens equally diadelphous. Pod oblong, membranous, 2¼ in. long by half as broad.—Benth. loc. cit. 47.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius! G. Don!* &c. Old Calabar, *Rev. W. C. Thomson!*

Lower Guinea. Angola, *Dr. Welwitsch!*

An imperfect specimen, gathered by Dr. Kirk in Zambesi land, probably represents a new species nearly allied to it. The young leaves and branches are densely grey-velvety, and the calyx and corolla, though similar in structure, are considerably larger.

9. **D. Afzelii,** *Baker.* Branches glabrous, woody, terete. Petioles ¼–⅝ in. long, the rachis 1½–2 in.; leaflets 15–19, oblong, short-stalked, 4–5 lines long, 2 lines broad, both ends rounded, conspicuously emarginate, coriaceous, both sides glabrous, veins not raised. Flowers in few-flowered panicles shorter than the leaves. Calyx 2 lines deep, glabrous, teeth lanceolate, not reaching more than a quarter of the way down. Corolla not seen. Immature pod 1½–2 in. long, 4 lines

broad, membranous, glabrous, blunt, with a distinct pedicel 3–4 lines long.

Upper Guinea. Sierra Leone, *Afzelius!*

10. **D. nitidula,** *Welw. mss.* A tree 25–35 ft. high, with a trunk 1–2 ft. thick, and unarmed finely grey-velvety woody branchlets. Petioles woody, 6–9 lines long; leaves 3–4 in. long, with 11–13 oblong shining coriaceous bluntish leaflets 12–20 lines long, 8–9 lines broad, rounded at the base, opaque and finely grey-velvety below, on petiolules a line long. Flowers in densely congested sessile axillary panicles. Pedicels nearly obsolete. Calyx campanulate, finely brown-velvety, $\frac{1}{8}$ in. deep, the deltoid teeth reaching a third down. Corolla $3\frac{1}{2}$ lines long, reddish, the keel shorter than the wings and unguiculate orbicular recurved standard. Stamens equally diadelphous. Ovary linear, densely silky, with a distinct pedicel. Pod not seen.

Lower Guinea. Angola; Ambaca, *Dr. Welwitsch!*

11. **D. Bakeri,** *Welw. mss.* A wide-climbing much branched shrub, with glabrous unarmed branches. Petiole 6–8 lines long; leaves 3–4 in. long, with 5–7 opaque scarcely coriaceous obovate-oblong glabrous bluntly pointed leaflets, 1–$2\frac{1}{4}$ in. long by 12–16 lines broad, on petiolules a line or less long, the base of the terminal one cuneate, the veins beneath very slightly raised. Flowers in sessile axillary panicles much shorter than the leaves. Pedicels glabrous, $1\frac{1}{2}$–2 lines long. Calyx campanulate, glabrous, 2 lines deep, the deltoid teeth not reaching more than a sixth of the way down. Corolla whitish, reddish when dried, $\frac{3}{8}$ in. long, the claws of all the petals as long as the calyx, the keel and wings shorter than the emarginate reflexed standard. Stamens equally diadelphous. Ovary linear, glabrous, with a pedicel nearly as long as itself. Pod not seen.

Upper Guinea. Cameroon mountains, at 5000 feet, *Mann!* (Petiolules a little longer, and calyx-teeth deeper.)

Lower Guinea. Angola, *Dr. Welwitsch!*

12. **D. macrosperma,** *Welw. mss.* A wide-climbing shrub with unarmed finely brown-velvety branches. Petioles 9–12 lines long; leaves 4–6 in. long, with 5 coriaceous oblong or obovate bluntly pointed leaflets, the terminal one 2–$3\frac{1}{4}$ in. long, 12–15 lines broad, the upper surface shining, the lower finely brown-velvety all over, on petiolules $1\frac{1}{2}$–2 lines long. Flowers in densely congested axillary panicles generally shorter than the petioles. Pedicels $\frac{1}{2}$–1 line long. Calyx campanulate, a line deep, densely brown-velvety, the deltoid teeth reaching a quarter of the way down. Corolla whitish (reddish when dried), $\frac{1}{4}$ in. deep, the claws of all the petals exceeding the calyx, the keel slightly shorter than the wings and standard. Stamens equally diadelphous. Pod oblong, reniform, 14–15 lines long, 7–8 lines broad, almost woody, finely brown-velvety, not at all reticulated, containing a single seed which nearly fills it.

Lower Guinea. Angola, *Dr. Welwitsch!*

74. **ECASTAPHYLLUM,** Rich.; Benth. et Hook. f. Gen. Plant. i. 545.

Calyx with the two upper teeth broader and the lowest rather longer than the others. Standard broad-ovate or orbicular; wings oblong; keel slightly incurved, obtuse, its petals connate at the apex on the back. Stamens all connate in a sheath slit above, or the upper one free or absent, or the sheath also slit below or the lowest sometimes also free; anthers small, erect, the cells dehiscing by a small apical slit. Ovary stalked, biovulate; style almost straight; stigma small, terminal. Pod orbicular or broad-oblong, flat or corky, indehiscent, 1-seeded, submarginate at the upper suture.—Loosely branched or sarmentose shrubs.

A small genus; all the species American; two also West African.

Leaflets solitary . . . . . 1. *E. Brownei.*
Leaflets 3–5 . . . . . 2. *E. monetaria.*

1. **E. Brownei,** *Pers.*; *DC. Prod.* ii. 420. A shrub 12–20 ft. high, with firm woody terete purplish-black branches, thinly silky when young. Petioles $\frac{1}{4}$–$\frac{3}{8}$ in. long, firm, woody; leaves simple, oblong, 3–4 in. long by about half as broad, blunt or pointed, the base rounded, texture coriaceous, both sides glabrous, or the lower when young thinly silky. Flowers in small cymose panicles 1–2 in. long in the axils of the leaves. Pedicels a line long. Calyx campanulate, $\frac{1}{8}$ in. deep, thinly silky, the teeth short, deltoid. Corolla white, more than twice as long as the calyx. Stamens 10, in two bundles of five each. Pod nearly round, short-stalked, 1–1$\frac{1}{4}$ in. broad, finally $\frac{1}{4}$–$\frac{3}{8}$ in. thick, subligneous. —Guill. et Perr. Fl. Seneg. 232; Benth. l.c. 50. *Amerimnum Sieberi,* Rich. in Sieber Pl. Exsicc. 36. *Pterocarpus Ecastaphyllum,* Linn. Sp. 1052.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Sieber! Perrottet!* and others. Guinea proper, *Vogel! Barter! Mylne!* Fernando Po, *Mann!*
Lower Guinea. Congo, *Prof. Smith!*
In Tropical America, from Florida to South Brazil.

2. **E. monetaria,** *Pers.*; *DC. Prod.* ii. 421. Stems firm, woody, terete, wide-climbing, glabrous. Petioles $\frac{1}{2}$ in. or less long; leaves rarely simple, 7–8 in. long, 3–4 in. broad; leaflets usually 3–5, oblong, 4–6 in. long, the base rounded, the point narrowed, coriaceous, both sides glabrous. Flowers in small panicles in the axils of the leaves. Calyx and corolla as in Sp. 1, but the stamens 9 only. Pod roundish, oblong, blunt at both ends, 1–1$\frac{1}{4}$ in. long, not so much thickened as in the preceding, dark brown, subligneous.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot!*
In America, from the West Indies to Brazil. According to Bentham, l. c. *E. Richardi* and *Plumieri,* Pers., *E. Berterii,* DC., *E. hygrophilum* and *nitidum,* Mart., and *E. Benthamianum,* Miq., are not distinct.

75. **DREPANOCARPUS,** G. F. Meyer; Benth. et Hook. f. Gen. Plant. i. 546.

Calyx campanulate, the teeth short deltoid. Standard broad-ovate, or orbicular; wings oblong, often falcate; keel incurved, its petals connate at the back. Stamens all connate in a sheath slit above, or both above and below, or the upper one free; anthers versatile. Ovary short-stalked, 1–2-ovulate; style incurved, filiform; stigma small, terminal. Pod falcate, compressed, coriaceous, indehiscent, 1-seeded, the upper suture prominent, the lower very much arched.—Our single species an erect spinose tree.

A small genus; all the species American; one also West African.

1. **D. lunatus,** *G. F. Meyer; DC. Prod.* ii. 420. An erect bush or small tree with firm glabrous branches, with sharp subfalcate spines from the nodes. Petioles short; rachis 2–4 in. long; leaflets 5–11, short-stalked, oblanceolate or oblong, 1½–2 in. long, blunt, rigidly coriaceous, both sides glabrous, the veins slightly raised. Panicles copious, axillary and terminal. Pedicels very short. Calyx campanulate, glabrous, ⅛ in. deep; teeth short, deltoid. Corolla *lilac*, 3–4 *lines* deep. Pod ¾ in. broad, curved round so that the point touches the base, subligneous, the curve 1¼–1½ in. broad; pedicel ¼ in. long.—Benth. l.c. 546; Guill. et Perr. Fl. Seneg. 231. *Pterocarpus lunatus,* Linn. f. suppl. 317. *P. apterus,* Gaertn. Fruct. t. 156. *Sommerfeldtia obovata,* Schum. et Thonn. Pl. Guin. 331.

Upper Guinea. Guinea proper, *Brass! Thonning, Barter! Mann!* Prince's island, *Mann!* Sierra Leone, *Afzelius! Don!* Senegambia, *Leprieur and Perrottet!*
Lower Guinea. Angola, *Dr. Welwitsch!*
In America, from the West Indies, southward to Brazil.

76. **PTEROCARPUS,** Linn.; Benth. et Hook. f. Gen. Plant. i. 547.

Calyx turbinate, narrowed at the base, the two upper teeth more or less connate. Standard orbicular or broad-ovate; wings obliquely obovate or oblong; keel with its petals resembling or shorter than the wings, free or shortly connate. Stamens all connate in a sheath slit above, or both above and below, or the upper one free; anthers versatile. Ovary sessile or stipitate, 2–6-ovulate; style filiform, slightly incurved; stigma small, terminal. Pod compressed, indehiscent, orbicular or broad-ovate, more or less oblique, the style lateral or terminal, seminiferous in the centre, and there more or less incrassated, with a wing round the border. Seeds 1 or 2.—Trees without prickles.

A small genus belting the world in the Tropics.

Leaves simple . . . . . 1. *P. simplicifolius.*
Leaves compound.
  Pod sessile, with a much thickened centre and very narrow wing . . . . . 2. *P. esculentus.*

Pods distinctly stalked, with a wing at least as broad as the disk.	
Style slightly oblique.	
Flowers in lax racemes; pedicels 4–6 lines long	3. *P. lucens.*
Flowers in ample panicles; pedicels 2–3 lines long . . .	4. *P. melliferus.*
Style so much deflexed that it is nearly parallel with the pedicel.	
Disk of pod naked	5. *P. tinctorius.*
Disk of pod densely muricated with fragile spines . . .	6. *P. erinaceus.*

1. **P. simplicifolius,** *Baker.* A small tree with woody terete glabrous branches. Petioles firm, glabrous, $\frac{1}{4}$–$\frac{3}{8}$ in. long; leaves simple, broad-ovate or roundish, 2–$2\frac{1}{2}$ in. long, blunt or subacute, coriaceous, rigid, glabrous, glaucous-green, the veins slightly raised. Flowers in 6–12-flowered lax axillary racemes, the peduncle and rachis each an inch long; the pedicels spreading 4–5 lines long, glabrous. Calyx turbinate, glabrous, 2–$2\frac{1}{2}$ lines deep, the teeth very short, deltoid. Corolla pale yellow, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, the upper stamen free. Pod broad-oblong, $1\frac{1}{2}$–$1\frac{3}{4}$ in. long, 1–$1\frac{1}{4}$ in. broad, tapering at the base to a short stalk, the centre slightly raised, the faces glabrous and glaucous, the wing rigid, 4–6 lines broad, the veins slightly raised, the style slightly oblique.

Upper Guinea. Nupe, *Barter!*

Closely resembles *P. lucens* in everything except its simple leaves.

2. **P. esculentus,** *Schum. et Thonn. Pl. Guin.* 330. An erect tree 25–30 ft. high with terete branches, the young twigs thinly silky. Petioles about an inch long, firm; leaves 3–6 in. long; leaflets 5–9, ovate or oblong, pointed, 2–4 in. long, the base rounded, coriaceous, both sides glabrous, veins not much raised. Flowers in dense axillary racemes 3–6 in. long, on short woody peduncles. Pedicels $\frac{1}{8}$ in. long, cernuous, thinly silky. Calyx turbinate, $\frac{1}{4}$ in. deep, thinly silky, the teeth irregularly deltoid, reaching a quarter of the way down. Corolla yellowish, not twice as long as the calyx, the standard half an inch broad. Stamens monadelphous. Pod roundish, sessile, $1\frac{1}{2}$ in. broad, the centre much thicker and more verrucose than in the other species, the faces glabrous, the rigid wing very narrow and sometimes absent from one side, the style slightly oblique.—Benth. l. c. 78. *P. santalinoides*, L'Her., DC. Prod. ii. 419.?

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Oldfield! Afzelius!* Guinea proper, *Thonning, Barter! Vogel! Mann!* Fernando Po, *Mann!*

The seeds are eatable, but when raw have an intoxicating effect. The species has been gathered in America, but may have been planted there.

3. **P. lucens,** *Guill. et Perr. Fl. Seneg.* 229. A small tree with woody glabrous branches. Petiole firm, glabrous, $\frac{1}{2}$–$\frac{3}{4}$ in. long; rachis 1–4 in. long; leaflets 3–7, oblong, $1\frac{1}{2}$–2 in. long, both ends rounded, coriaceous, both sides glaucous with the veins slightly raised, the upper surface glabrous, lower finely grey-silky when young. Flowers in lax 12–20-flowered racemes, the peduncle an inch long, the rachis 2–3 in., the lower flowers drooping with glabrous spreading pedicels 4–6 lines long. Calyx turbinate, glabrous, $\frac{1}{4}$ in. deep, the teeth short, deltoid,

finely ciliated. Corolla yellow, twice the calyx, the upper stamen free. Pod broad-oblong or nearly round, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad, tapering to a short pedicel, the centre not much thickened, the wing rigid, 3–4 lines broad, the faces glabrous, with slightly raised veins, the style slightly oblique. —Benth. l. c. 75. *P. abyssinicus*, Hochst. in Schimp. Hb. Abyss. No. 1597; A. Rich. Fl. Abyss. i. 233 t. 45. *Dalbergia præcox*, Hochst. in Schimp. Hb. Abyss. No. 890.

Upper Guinea. Senegambia, *Leprieur and Perrottet!*
Nile Land. Abyssinia, *Schimper!* Callabat, *Schweinfurth!*
Mozamb. Distr. Senna, *Dr. Kirk!* (Pod longer and narrowed more gradually at the base).

There is an allied plant in Zambesi land which has a pod 3–4 in. long, 2–3 in. broad, with the veins scarcely raised, and a rigid coriaceous wing about an inch broad all round the slightly raised centre. This may be the Natal *P. sericeus*, Benth., but we have the pods only.

4. **P. melliferus,** *Welw. mss.* A noble tree 50–80 or even 100 ft. high, with glabrous woody branchlets. Petioles woody, glabrous, 1–2 in. long; leaves 6–10 in. long, with 5–7 glabrous obovate or oblong bluntish alternate coriaceous leaflets, 4–5 in. long, $2\frac{1}{2}$–3 in. broad, glabrous and shining above, finely downy at first below, on petiolules 6–9 lines long. Flowers in copious terminal panicles a foot or more across, with thyrsoid branchlets barren downwards. Pedicels finely grey-downy, 2–3 lines long. Calyx glabrous, nearly black, $\frac{1}{4}$ in. deep, with deltoid teeth reaching $\frac{1}{3}$–$\frac{1}{4}$ down. Corolla bright yellow, 7–8 lines deep, with a round standard 5–6 lines broad, upper stamen connate with the others. Pod oblong, slightly oblique, coriaceous, naked, 2–3 in. long, 18–21 lines broad, casually 2-seeded, with a pedicel exceeding the calyx.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

5. **P. tinctorius,** *Welw. mss.* A tree 40–70 ft. high, with hard red or white wood and glabrous branchlets. Petiole 9–18 lines long; leaves 4–8 in. long, with 7–9 oblong cuspidate glabrous coriaceous leaflets $1\frac{1}{2}$–2 in. long, on patent petiolules $1\frac{1}{2}$–3 in. long. Flowers in copious rather dense panicles 4–5 in. broad, with racemose branchlets; pedicels 1–$1\frac{1}{2}$ lines long. Calyx $\frac{1}{4}$ in. deep, densely brown-velvety, the teeth deltoid, reaching a quarter of the way down. Corolla bright yellow, twice the calyx, the orbicular standard purplish-brown on the back, 4 lines broad. Stamens monadelphous. Pod round, ultimately 4–5 in. broad, at first finely velvety, the membranous wing twice as broad as the disk; style deflexed; pedicel 6–8 lines long.—Var. β. *macrophyllus*, Welw. mss. Panicle larger and laxer. Leaflets 3–5 in. long, 2–$2\frac{1}{4}$ in. broad.

Lower Guinea. Angola, widely distributed, *Dr. Welwitsch!*

6. **P. erinaceus,** *Poir.; DC. Prod.* ii. 419. A tree often 40–50 ft. high with slender woody densely grey-pubescent branchlets. Petioles 1–2 in. long; leaves 6 in. to a foot long, with 5–15 distinctly stalked alternate ovate or oblong leaflets, which are 2–4 in. long, rounded at

the base, subacute, glabrous above, often at first finely pubescent below. Flowers in copious panicles with 20–30-flowered racemose branches. Pedicels and obconical calyx finely grey-pubescent, the latter $2\frac{1}{2}$ lines long with short subdeltoid teeth. Corolla bright yellow, twice the calyx, the standard orbicular, $\frac{3}{5}$ in. broad, purple on the back, the upper stamen free or connate at the base. Pod round, 2–3 in. broad when fully developed, the membranous wing rather broader than the densely echinate disk; style lateral or deflexed; pedicel about as long or twice as long as the calyx.—Guill. et Perr. Fl. Seneg. 229 t. 54. *P. Adansonii*, *angolensis*, and *echinatus*, DC. loc. cit.

Upper Guinea. Senegambia, *Heudelot! Perrottet!* Niger country, *Barter!*
Lower Guinea. Angola, *Dr. Welwitsch!*

Produces the African gum Kino, and the wood much used. See R. Brown's remarks on Oudney's Travels, p. 29, and Hooker in Gray's Travels in West Africa, p. 395. It flowers in November and December, and the seeds are ripe in May.

77. **OSTRYOCARPUS**, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 518.

Calyx tubular-campanulate, the teeth short, deltoid. Standard broad-rhomboidal, recurved, exappendiculate; wings falcate-oblong; keel oblong, incurved, obtuse, its petals joined along the back. Upper stamen free from the base, the others connate; anthers versatile. Ovary sessile, pauciovulate; style filiform; stigma small, terminal. Pod orbicular, compressed, indehiscent, coriaceous, not winged, the style terminal. Seed one.—Climbing shrubs.

Two species, restricted to West Tropical Africa.

Leaflets 5	1. *O. riparius.*
Leaflets 17–31	2. *O. Welwitschii.*

1. **O. riparius,** *Hook. f. Fl. Nigr.* 316. A wide-climbing shrub, sometimes 40 ft. long, the young twigs slightly ferruginous-pubescent. Petioles 2–4 in. long, woody, glabrous, the rachis rather longer; leaflets 5, lateral ones opposite, short-stalked, the terminal one obovate-oblong, 4–8 in. long, both ends rounded, coriaceous, glabrous, the veins not raised. Flowers in ample panicles with numerous narrow many-flowered racemose branches. Pedicels very short. Calyx 2 lines deep, glabrous. Corolla yellowish, twice as long as the calyx. Pod 2 in. each way, flat, rigid, glabrous, coriaceous.—Benth. l. c. 85.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Don! Vogel!* Guinea proper, *Mann!* Fernando Po, *Vogel!*

2. **O.? Welwitschii,** *Baker.* A wide-climbing shrub; branches glabrous with a few inconspicuous spines. Petioles slender, glabrous, 2–$2\frac{1}{2}$ in. long; leaves 9–14 in. long, with 17–31 elliptical glabrous unequal-sided opposite leaflets, central one $1\frac{1}{2}$–3 in. long by 8–12 lines broad, on patent petiolules 1–$1\frac{1}{2}$ lines long, deciduous when the plant is in flower. Flowers in dense ascending racemes 4–5 in. long on short peduncles. Pedicels 1–$1\frac{1}{2}$ lines long, ascending, velvety, often fascicled. Calyx 2 lines deep, campanulate, silky, the deltoid

teeth reaching a third of the way down. Corolla twice the calyx, the petals sulphur-yellow, spotted with red; standard round; wings oblong, both with a long claw; keel shorter. Upper stamen free, the rest all connate. Ovary linear, silky, sessile, 4–5-ovulate. Pod unknown.

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

78. **LONCHOCARPUS**, H. B. K.; Benth. et Hook. f. Gen. Plant. i. 548.

Calyx campanulate, the teeth deltoid or rarely lanceolate. Standard orbicular, obovate or rarely linear-oblong; wings obliquely oblong or falcate, slightly adhering to the keel above the claw; keel arcuate or nearly straight, the petals slightly cohering along the back. Upper stamen free at the base, united with the others at the middle in a closed tube; anthers versatile. Ovary more or less stalked, bi- or multiovulate; style incurved, filiform; stigma small, terminal. Pod oblong or elongated, flat, membranous or coriaceous, indehiscent, the style-scar terminal, sutures not winged but the upper sometimes laterally dilated. Seeds 1 or few.—Trees or woody climbers, with the habit of *Millettia*.

A considerable genus. One species Australian, the others all African and American.

Flowers solitary or in pairs.
- Standard densely and permanently argenteous on the back . 1. *L. sericeus.*
- Standard glabrous on the back.
  - Erect trees.
    - Lower teeth of calyx deltoid . . . . . 2. *L. laxiflorus.*
    - Lower teeth of calyx lanceolate . . . . . 3. *L. pallescens.*
  - Woody climbers.
    - Calyx a line deep, grey-silky. . . . . 4. *L. cyanescens.*
    - Calyx 2 lines deep, densely brown-silky . . . . . 5. *L. macrostachyus.*

Flowers densely fascicled.
- Standard linear-oblong, a line broad . . . . . 6. *L. fasciculatus.*
- Standard ovate, $\frac{3}{8}$ inch broad . . . . . 7. *L. Barteri.*

1. **L. sericeus,** *H. B. K.; DC. Prod.* ii. 260. An erect tree 30–40 ft. high, the young branches densely ferruginous-silky. Petioles 1–2 in. long; leaflets 7–11, oblong or slightly obovate, 2–3 in. long, blunt, the base rounded, subcoriaceous, upper surface glabrous, lower densely finely brown-silky. Flowers in dense pendent racemes 4–6 in. long on firm woody peduncles nearly as long. Pedicels densely silky, equalling the calyx, which is 3–4 lines deep, densely brown-silky, almost truncate. Flowers often in pairs. Bracts small, silky, rounded. Corolla $\frac{5}{8}$–$\frac{3}{4}$ in. deep, lilac, the standard round, more than $\frac{1}{2}$ in. broad, densely and permanently argenteous on the outside. Pod oblong, 3–4 in. long, $\frac{3}{4}$–$\frac{7}{8}$ in. broad, narrowed at the base to a long pedicel more or less silky, finally subligneous, the upper suture with a projecting ridge on each side.—Benth. in Journ. Linn. Soc. iv. Suppl. 88. *Robinia sericea*, Poir. *L. pyxidarius*, DC. l. c. *L. tomentosus*, Tulasne in Arch. Mus. Par. iv. 82. Var. β (*L. Formosianus*, DC. l. c.), branches and

calyx less silky, leaves nearly or ultimately quite glabrous below. *L. domingensis*, DC. l. c. *L. macrophyllus*, H. B. K. Nov. Pl. 383. *Robinia violacea*, Beauv. Fl. Owar., ii. 28, t. 76. *R. argentiflora*, Schum. et Thonn. Pl. Guin. 352.

Upper Guinea. Senegambia, *Perrottet! Heudelot! Skues!* St. Thomas, *G. Don! Dr. Welwitsch!* Sierra Leone, *Afzelius! Miss Turner! Dr. Daniell!* Guinea proper, *Thonning, Vogel!* and others.

Lower Guinea. Angola, *Dr. Welwitsch!*

2. **L. laxiflorus,** *Guill. et Perr. Fl. Seneg.* i. 226. An erect tree 15–20 ft. high, the young branches slightly grey-velvety. Petioles 2 in. long.; leaflets 5–7, oblong or ovate, 3–4 in. long, 1½–2 in. broad, bluntish, the base rounded, subcoriaceous, both sides glabrous, pale glaucous-green. Flowers in solitary or fascicled panicles sometimes a foot long, the branches racemose, slender, erecto-patent or spreading, 3–4 in. long, dense upwards. Pedicels ⅛ in. long. Calyx 2 lines deep, finely grey-velvety, sometimes nearly glabrous, the teeth deltoid, reaching a quarter of the way down. Corolla ½ in. deep, pale violet, the standard reflexed, oblong, glabrous, ¼ in. broad, appendiculate at the base. Pod 3–4 in. long, ⅝ in. broad, membranous, straight, glabrous, acute, narrowed gradually to the pedicel, 2–3-seeded.—Benth. l. c. 97. *L. Philenoptera*, Benth. l. c.; Harv. et Sond. Fl. Cap. ii. 263. *Philenoptera Schimperiana*, Hochst. in Schimp. Hb. Abyss. No. 1802; A. Rich. Fl. Abyss. i. 232. *P. Kotschyana*, Fenzl in Flora, 1844, 312. *Capassa violacea*, Klotzsch in Peters' Mossamb. Bot. 28, t. 5.

Upper Guinea. Senegambia, *Heudelot! Perrottet!*

Nile Land. Nubia, *Kotschy!* Abyssinia, *Schimper!* Madi, *Speke and Grant*, 743!

South Central. Banks of Lake Ngami, *McCabe!*

Mozamb. Distr. Zambesi land, *Kirk!* Mozambique, *Peters!*

Var. β. *sericeus*, leaflets 3–5, the terminal one obovate, 4 in. long by nearly 3 in. broad, densely grey-velvety beneath.

Mozamb. Distr. Zamba, and east end of Lake Shirwa, *Dr. Meller!*

Lower Guinea. Angola, *Dr. Welwitsch!*

We cannot separate from this the *L. Sophiæ* of Kotschy and Peyritsch, figured in Plantæ Tinneanæ, t. ii.

3. **L. pallescens,** *Welw. mss.* An erect tree 40–50 ft. high with the habit of *Fraxinus*, and glabrous branches. Petioles slender, 1–2 in. long; leaves deciduous at flowering time, 6–8 in. long with 7 ovate-oblong glabrous pointed grey opaque coriaceous leaflets, the terminal one 3–4 in. long, 12–18 lines broad, on petiolules ¼ in. long. Flowers in copious decompound lax terminal panicles with patent branches. Pedicels 2–3 lines long, densely grey-velvety. Calyx broad-campanulate, 2½–3 lines deep, velvety, the lower teeth lanceolate, reaching halfway down. Corolla scarcely twice the calyx, dull violet, the standard orbicular, glabrous, 4 lines broad, the keel-petals rather shorter, 2 lines broad. Pod membranous, short-stalked, linear, 4–5 in. long, 8–9 lines broad, grey-velvety, subfalcate, 4–5-seeded.

Lower Guinea. Angola, Zenza do Golungo, *Dr. Welwitsch!*

4. **L. cyanescens,** *Benth. in Journ. Linn. Soc.* iv. *Suppl.* 96. A woody climber, 20 or 30 ft. long, the branches glabrous or slightly silky. Petioles firm, woody, 2–3 in. long; leaflets 9–11, oblong, 3–5 in. long, pointed, the base rounded, the lower ones much shorter, coriaceous, both sides glabrous. Flowers in copious often fascicled panicles sometimes a foot long, the branches short, spreading, densely-flowered but not fascicled. Bracts linear, equalling the pedicels, 1 line long. Calyx 1 line deep, finely grey-silky, the teeth deltoid, reaching a quarter of the way down, the two upper ones connate. Corolla three times as long as the calyx, violet, the standard glabrous, $\frac{1}{4}$ in. broad, not appendiculate. Pod 6–7 in. long, 1 in. broad, narrowed to both ends, stalked, membranous, glabrous, 4–5-seeded.—*Robinia cyanescens,* Schum. et Thonn. Pl. Guin. 351.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius! Smeathmann!* and others. Guinea proper, *Schumacher and Thonning! Barter!* Fernando Po, *Mann!*

5. **L. ? macrostachyus,** *Hook. f. Fl. Nigr.* 317. A woody climber 25 ft. long, the branches glabrous. Petioles 2 in. long, firm, glabrous; leaflets 5–7, obovate-oblong, the terminal one 5–6 in. long, cuspidate, the base rounded, subcoriaceous, both sides glabrous. Flowers in ample thyrsoid panicles often a foot long, the branches numerous, slender, erecto-patent, regular, not more than 2 in. long, the flowers dense in the upper part. Pedicels a line long. Calyx 2 lines deep, ferruginous-silky, the teeth very short. Corolla rose-red, $\frac{5}{8}$ in. deep, the orbicular standard $\frac{1}{2}$ in. broad, reflexed, glabrous on the back. Ovary linear, finely brown-silky, subsessile, multiovulate. Pod unknown.—Benth. l. c. 97.

Upper Guinea. Niger country, *Vogel! Mann!*

We have an allied species from Zambesi land in too imperfect a state to describe. The full-grown pod is quite woody, a foot long, $1\frac{1}{2}$ in. broad, the faces flat and glabrous, the upper suture not at all winged, and the full-developed leaflets are six inches long by more than half as broad, obovate, subcoriaceous, both sides quite glabrous.

6. **L. ? fasciculatus,** *Benth. l. c.* 100. A woody climber with finely ferruginous-velvety branches. Petioles 2–3 in. long, firm, glabrous; leaflets 7–9, oblong or with a slight obovate tendency, 3–6 in. long, shortly cuspidate, the base rounded, coriaceous, both sides glabrous. Flowers in a thyrsoid panicle reaching $1\frac{1}{2}$ ft. long, in dense fascicles of 6–12 on a short branchlet with a space between the clusters. Calyx subsessile, $\frac{1}{8}$ in. deep, ferruginous-silky, tubular, the teeth deltoid, reaching a quarter down, the two upper ones connate. Corolla whitish, three times as long as the calyx; standard linear-oblong, not more than a line broad, glabrous; wings very narrow; keel incurved, its petals a line broad. Ovary linear, sessile, silky, 2–3-ovulate. Immature pod linear, densely ferruginous-silky.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Morson! Afzelius!*

7. **L. Barteri,** *Benth. l. c.* 99. A woody climber, with glabrous branches. Petioles 1–4 in. long, firm, glabrous; leaflets 5–7, oblong or

with a slight obovate tendency, 5–6 in. long, acuminate or cuspidate, the base rounded, subcoriaceous, both sides glabrous and opaque or the lower slightly rufescent on the veins. Flowers in panicles 6–12 in. long, which are sometimes nearly simple, in none of our specimens more than slightly branched below, the peduncles several inches long, firm, woody, rigid, erecto-patent, the flowers fascicled. Pedicel a line long. Calyx campanulate, 2 lines deep, ferruginous-silky, the teeth broad, deltoid, reaching a quarter down. Corolla rose-coloured, $\frac{1}{2}$ in. deep, the standard ovate, $\frac{3}{8}$ in. broad, thinly silky on the back. Ovary subsessile, silky, with 5–6 ovules. Immature pod linear, woody, $2\frac{1}{2}$ in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, finely brown-velvety.—*L. Heudelotianus*, Baillon in Adans. vi. 222.

Upper Guinea. Senegambia, *Heudelot!* Guinea proper, *Barter! Mann!*
Lower Guinea. Congo, *Prof. C. Smith.*
Closely allied to the American *L. nitidulus* and *rufescens.*

79. **DERRIS,** Lour.; Benth. et Hook. f. Gen. Plant. i. 549.

Calyx with very short or obsolete teeth. Standard obovate or orbicular, not appendiculate; wings obliquely oblong, slightly adhering to the keel above the claw; keel slightly incurved, the petals cohering slightly along the back. Upper stamen free at the base, connate with the others at the middle in a closed tube, rarely entirely free; anthers versatile. Ovary sessile or short-stalked, bi- or multiovulate; style filiform, incurved; stigma small, terminal. Pod oblique, orbicular or oblong, flat, subcoriaceous, indehiscent, the style-scar terminal, one suture or both margined with a narrow wing. Seeds solitary or separated.—Wide-climbing shrubs or rarely trees.

A considerable genus, belonging principally to Tropical Asia.

Standard linear oblong, 1 line broad . . . . . 1. *D. glabrata.*
Standard oblong or orbicular, 2–3 lines broad.
  Both sutures winged . . . . . 2. *D. lucida.*
  Lower suture only winged . . . . . 3. *D. nobilis.*
  Upper suture only winged.
    Leaves glabrous, pointed . . . . . 4. *D. uliginosa.*
    Leaves deeply emarginate and cuspidate, permanently velvety beneath . . . . . 5. *D. brachyptera.*

1. **D.? glabrata,** *Welw. mss.* An erect shrub 3–6 ft. high, with inconspicuously grey-downy branches. Petioles 2–3 in. long; leaves 6–8 in. long, with 5 or usually 7 obovate-oblong coriaceous deeply emarginate opaque grey-green leaflets, the terminal one $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, $1\frac{1}{2}$–2 in. broad, glabrous above, with only a little short brown pubescence on the ribs below. Petiolules $\frac{1}{8}$ in. long, not stipellate. Flowers densely fascicled in copious terminal panicles with narrow densely flowered short-stalked racemose branches. Pedicels under a line long. Calyx turbinate, a line deep, densely brown-velvety, the deltoid teeth reaching a quarter down. Corolla three times the calyx, whitish (reddish when dried); standard linear-oblong, recurved, 1 line broad; wings very narrow, shorter than the slightly incurved keel, the petals

of which are a line broad; vexillary stamen free downwards. Ovary linear, sessile, silky, with several ovules. Pod unknown.

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

2. **D. lucida,** *Welw. mss.* A wide-climbing evergreen shrub with strong glabrous terete branches. Petioles 1½–5 in. long; leaves 6–12 in. long, with 5–9 obovate-oblong coriaceous leaflets, terminal one 4–5 in. long by about half as broad, glabrous, very shining above; petiolules 3–4 lines long. Flowers in axillary and terminal thyrsoid panicles sometimes a foot long, the rigid erecto-patent branches naked downwards, the clusters densely fascicled, especially at the apex of the branchlets. Pedicels under a line long. Calyx campanulate, ⅛ in. deep, inconspicuously velvety, the deltoid teeth reaching a quarter down. Corolla 5 lines deep, whitish, the keel and narrow wings slightly exceeding the recurved ovate standard. Upper stamen free. Ovary sessile, 3–5-ovulate. Pod (immature) oblong, 2¼ in. long by half as broad, membranous, with a narrow wing along each suture.

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

3. **D. nobilis,** *Welw. mss.* A wide-climbing or rarely erect bush with densely velvety woody terete branches. Petioles 4–6 in. long; developed leaves 9–12 in. long with 5–7 obovate coriaceous subacute leaflets, the terminal one 4–7 in. long, 2–3½ in. broad, glabrous above, densely and permanently clothed with ferruginous tomentum below; petiolules 1½–2 lines long, stipellate. Flowers fascicled in panicles sometimes more than a foot long with dense racemose branches. Pedicels very short. Calyx campanulate, ⅛ in. deep, densely velvety, the 4 deltoid teeth reaching a quarter down. Corolla three times the calyx, pale reddish when dried, the standard oblong, 2 lines broad, slightly shorter than the deep keel, to which the very inconspicuous wings almost entirely adhere. Upper stamen free at base, united above. Pod membranous, linear-oblong, 3–3½ in. long, 1 in. broad, glabrous, 1-seeded, with a wing ⅛ in. broad along the lower suture.

Lower Guinea. Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*

4. **D. uliginosa,** *Benth. in Pl. Jungh.* i. 252. A wide-climbing shrub with firm glabrous terete woody branches. Petioles 1½–3 in. long; leaflets 3, 5 or 7, distant, oblong, 2–4 in. long by about half as broad, acuminate, base rounded, sometimes cordate, coriaceous, both sides glabrous, veins not raised, petiolules 2 lines long. Flowers in narrow sparingly compound subracemose panicles from 3–6 or even 9 in. long on firm short woody peduncles. Pedicels about equalling the calyx, which is about ⅛ in. deep, campanulate, slightly oblique, subtruncate, glabrous or thinly silky. Corolla pale rose, three times as long as the calyx; standard orbicular, ¼ in. broad. Pod 1½ in. long, about 1 in. broad, upper suture nearly straight with a narrow rigid wing, the lower much rounded, not winged, valves compressed, coriaceous, glabrous, finely reticulated; seeds 2.—Benth. in Journ. Linn. Soc. iv. Suppl. 107.

Pongamia uliginosa, DC. Prod. ii. 416. *Derris Forsteniana*, Miq. Fl. Ned. Ind. i. 144. *P. madagascariensis*, Bojer.

Mozamb. Distr. Zambesi land, banks of the Luabo, and in the Zambesi delta, *Kirk!* Stems used when beaten as a fish poison, acting rapidly and effectively.
Extends through Asia to North Australia, and also occurring in Madagascar.

5. **D. brachyptera,** *Baker.* A wide-climbing shrub (sometimes 80 ft. long) with finely velvety woody branches. Petioles 3–6 in. long; developed leaves upwards of a foot long with 5–7 obovate coriaceous leaflets, conspicuously emarginate and mucronate, terminal 5–10 in. long, 3–7 in. broad, upper surface glabrous, the lower densely clothed with grey or ferruginous velvety tomentum. Petiolules $\frac{1}{4}$ in. long, stipellate. Flowers fascicled in racemes sometimes a foot long or in ample panicles with racemose branches. Pedicels very short. Calyx 2 lines deep, campanulate, grey-velvety, the deltoid teeth not reaching a quarter down. Corolla pale rose, $\frac{1}{2}$ in. deep, the wings and deep keel exceeding the oblong standard. Stamens all connate in a long tube. Pod membranous, linear-oblong, $2\frac{1}{2}$–3 in. long, 1 in. broad, glabrous, 1-seeded, with a wing $\frac{1}{8}$ in. broad along the upper suture.

Upper Guinea. Senegal, *Heudelot!*
Lower Guinea. Angola, *Dr. Welwitsch!*

80. **ANDIRA,** Lam.; Benth. et Hook. f. Gen. Plant. i. 550.

Calyx-teeth short or obsolete. Standard suborbicular, exappendiculate; wings nearly straight, oblong, obtuse, free; keel-petals like the others, imbricated but not connate on the back. Upper stamen free or rarely connate with the rest; anthers versatile. Ovary long-stalked in our plant, 2–4-ovulate; style short incurved; stigma small, terminal. Legume drupaceous, ovoid or obovoid, indehiscent. Seed solitary, pendulous.—Strong trees.

A moderately small genus, all the species American, unless our second, which is only known very imperfectly and may not belong here, be peculiar to Africa.

Panicle broadly pyramidal, ovary glabrous slightly ciliated . . . 1. *A. inermis.*
Panicle very narrow, ovary villous . . . . . 2. *A. gabonica.*

1. **A. inermis,** *H. B. K. Nov. Gen.* vi. 385. A tree 20 or 30 ft. high with firm woody branches, the young twigs slightly grey-pubescent. Petioles 2–3 in. long; leaflets 9–13, the pairs more than an inch apart, lanceolate or oblong or the terminal one obovate, 2–3 in. long, $\frac{5}{8}$–1 in. broad, bluntish or subacute, the base scarcely rounded, subsessile, texture subcoriaceous, both sides glabrous, veins not raised. Flowers in pyramidal panicles sometimes a foot long, with distant spreading stalked racemose closely-flowered branches. Calyx subsessile, silky, 2 lines deep, the teeth very short. Corolla rose-coloured, 6–7 lines deep, the standard 3–4 lines broad, the ovary distinctly stalked, glabrous or slightly ciliated, with 3 or 4 ovules. Ripe pod not seen, but in an undeveloped state the pedicel exceeds the calyx and all but one of the ovules are abortive.—Benth. in Journ. Linn. Soc. iv. Suppl. 122. *Andira racemosa,*

Lam. Enc. i. 171, t. 604, fig. 1. *A. grandiflora*, Guill. et Perr. Fl. Seneg. 254. *A. acuminata*, Benth. in Ann. Mus. Vind. ii. 109.

Upper Guinea. Senegambia, *Heudelot!*

2. **A.? gabonica,** *Baillon in Adans.* vi. 219. (*adnot.*). Young branches densely villous. Rachis of the leaves 10 in. long, slender; leaflets 11, alternate or subopposite, short-stalked, ovate, 3 in. long, 1½ in. broad, acute, the base rounded, subcoriaceous, upper surface shining, lower opaque. Flowers in panicles with short few-flowered densely villous branches. Calyx purplish, villous, ¼ in. deep. Corolla white, three times as long as the calyx, the standard obtuse, finally reflexed, rather shorter than the other petals, the upper stamen quite free. Ovary short-stalked, villous, 2–3-ovulate; style subulate, arcuate. Pod not known.

Upper Guinea. Banks of the Gaboon, *Duparquet* (*fide Baillon*).

81. DALHOUSIEA, Wall.; Benth. et Hook. f. Gen. Plant. i. 552.

Calyx campanulate, teeth very short. Standard orbicular, subsessile; wings obliquely oblong, free; keel broader than the wings, erect, oblique, its petals subcoherent along the back, with very short claws. Stamens free; anthers linear-oblong, shorter than their filaments. Ovary subsessile, pauciovulate; style slightly incurved; stigma small terminal. Pod obliquely oblong, narrowed at both ends, compressed, coriaceous, 2-valved, continuous within. Seeds 2–3.—A shrub with large ovate persistent bracts and bracteoles, the latter quite including the flower.

A single species, common to Angola and the Himalayas, but not known in the intermediate country.

1. **D. bracteata,** *Wall. Cat. Herb. Ind. Or.* No. 5339. A shrub with terete glabrescent almost sarmentose branches. Petiole 1–3 in.; leaves simple, subcoriaceous, glabrous oblong acute, of the flower-shoot 4–6, on the barren reaching 6–12 in. long. Flowers in ample terminal panicles with few-flowered subcorymbose branches reaching down among the leaves. Bracts round, 3–4 lines, ciliated. Calyx 1½–2 lines, quite enveloped in a pair of similar bracteoles. Corolla snow-white, much longer. Pod rigidly coriaceous, glabrous, 2½–3 in. long, 12–15 lines broad.—Wight Ic. t. 265.

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

82. BAPHIA, Afzel.; Benth. et Hook. f. Gen. Plant. i. 553.

Calyx ovoid or globose, shortly toothed, slitting as the flower expands either into two reflexed lobes or down to the base along one line. Petals subsessile; standard orbicular; wings obliquely oblong or obovate; keel slightly incurved, obtuse, the petals slightly coherent. Stamens free, the anthers shorter than the filaments. Ovary subsessile,

2–6-ovulate; style incurved, shortly subulate; stigma small, terminal. Pod linear-lanceolate, straight or falcate, acuminate, flattened, coriaceous or submembranous, continuous and slightly filled up within. —Trees or shrubs, with simple leaves, sometimes climbing.

All the species Tropical African, one extending to Natal.

* **Bracteolaria** (*Hochst.*). Calyx bilabiate.
Twigs and calyx thinly grey-silky.
Pod straight, 3–4 in. long . . . . . 1. *B. polygalacea.*
Pod recurved, 2 in. long . . . . . 2. *B. racemosa.*
Twigs and calyx densely brown-velvety . . . . . 3. *B. Heudelotiana.*

** **Delaria** (*Desv.*). Calyx spathaceous.
Bracteoles as long as the calyx . . . . . 4. *B. pilosa.*
Bracteoles much shorter than the calyx.
Calyx membranous-glabrous.
Branches glabrous.
Calyx half as long as corolla . . . . . 5. *B. nitida.*
Calyx as long as corolla . . . . . 6. *B. angolensis.*
Branches densely tomentose . . . . . 7. *B. Kirkii.*
Calyx coriaceous, more or less silky.
Calyx grey-downy . . . . . 8. *B. maxima.*
Calyx clothed with ferruginous silky hairs.
Pod recurved grey-silky . . . . . 9. *B. spathacea.*
Pod straight glabrous . . . . . 10. *B. pubescens.*

1. **B. polygalacea,** *Baker.* An erect shrub 8–10 ft. high with slender terete glabrous or slightly downy branches. Petioles slender, 1–1½ in. long; leaves ovate or oblong, cuspidate or acuminate, 3–5 in. long by 2–2½ in. broad, the base rounded, sometimes cordate, subcoriaceous, both sides glabrous, the main veins prominent beneath. Flowers in an ample panicle either mixed with or separate from the leaves; branches firm, erecto-patent; pedicels 2–2½ lines long, spreading at a right angle. Calyx with two minute rounded bracteoles at the base, membranous, slightly adpressed-silky, 2½ lines deep, the divisions oblong, ultimately reflexed. Corolla white, half as long again as the calyx. Pod linear, nearly straight, 3–4 in. long, ½–⅝ in. broad, narrowed gradually to both ends, glabrous, rigid, subcoriaceous, seeds 2–3.—*Bracteolaria polygalacea,* Hook. f. Fl. Nigr. 322. *Delaria pyrifolia,* Desv. Linnæa, ii. 510. *Carpolobia dubia,* G. Don, Gard. Dict. i. 370.

Upper Guinea. Sierra Leone, *Afzelius! G. Don! Barter! Dr. Kirk!* Fernando Po, *Barter! Mann!* Niger land, *Vogel! Barter!* and others.

2. **B. racemosa,** *Hochst. in Flora* 1841, part 2, 638. An erect shrub 6 or 8 ft. high with glabrous branches. Petioles slender, ½–¾ in. long; leaves oblanceolate or narrowly oblong or ovate-oblong, acute, 2½–3 in. long, the base cuneate or slightly rounded, subcoriaceous, under surface a little silky when young. Flowers in an irregular ample leafy panicle; pedicels thinly silky, 2 lines long, spreading at a right angle, or sometimes cernuous. Bracteoles minute, ovate. Calyx membranous, slightly grey-silky, 2½ lines deep. Corolla white, half as long again as the calyx, the standard ⅜ in. broad, marked with purple veins. Pod 2 in. long, ¾–⅞ in. broad, the point recurved, firm, glabrous, coriaceous.

Seeds generally two. *Bracteolaria racemosa*, Walp. Rep. v. 565. Harv. Thes. t. 20; Harv. et Sond. Fl. Cap. ii. 268.

South Central. Highlands of the Batoka country, *Dr. Kirk!*
Also a plant of Natal.

3. **B. Heudelotiana,** *Baillon in Adans.* vi. 216 (*adnot.*). An erect shrub 12–20 ft. high, the branches densely clothed with pale ferruginous tomentum. Petioles $\frac{1}{2}$ in. long, tomentose; leaves oblong, 4 in. long by half as broad, acute, the base rounded, subcoriaceous, glabrescent, midrib on both sides ferruginous-silky. Flowers (in our single specimen) down amongst the leaves in erecto-patent racemes 3–4 in. long, the rachis tomentose; pedicels erecto-patent, $\frac{1}{4}$–$\frac{1}{2}$ in. long; bracteoles round, under a line deep. Calyx $\frac{1}{4}$ in. deep, ferruginous-silky, with rather narrower divisions than in the last, the corolla nearly twice as long; standard $\frac{1}{2}$ in. broad. Ovary linear, sessile, densely silky, with four ovules. Pod not seen.

Upper Guinea. Senegambia, *Heudelot!*

4. **B. pilosa,** *Baillon in Adans.* vi. 216 (*adnot.*). Branches terete, clothed when young with long soft yellowish hairs. Petioles 1 in. long, clothed like the branches; leaves lanceolate-oblong, 5–6 in. long by about half as broad, acute, rounded at the base, subcoriaceous, under surface at first villous on the veins, finally glabrous. Racemes axillary, usually a little longer than the petioles, few-flowered. Bracteoles oblong, with scattered subrigid hairs, equalling or slightly shorter than the membranous calyx. Standard slightly longer than the other petals. Ovary densely silky, the hairs strong and spreading. Ovules six. Mature pod not known.

Upper Guinea. Banks of the Gaboon, *Duparquet*, (*fide Baillon, l.c.*).

5. **B. nitida,** *Afzel.; DC. Prod.* ii. 424. An erect shrub 8 or 10 ft. high with slender terete glabrous branches. Petioles $\frac{1}{2}$–1 in. long on the flowering branches; leaves ovate or oblong, 4–6 in. long by about half as broad, acute, base rounded, subcoriaceous, glabrous. Flowers 1–4 together on the main branches, on slender erecto-patent glabrous pedicels $\frac{1}{4}$ in. long. Bracteoles small, round, spreading, united at the base. Calyx membranous, glabrous, $\frac{1}{4}$ in. deep. Corolla white, $\frac{1}{2}$ in. deep; the standard round, $\frac{1}{2}$ in. broad. Pod linear, straight, 4 in. long, $\frac{1}{2}$–$\frac{5}{8}$ in. broad, the valves rigid, coriaceous, glabrous. Seeds 2–4.—*Podalyria hæmatoxylon*, Schum. et Thonn. Pl. Guin. 202. *Baphia hæmatoxylon*, Hook. f. Fl. Nigr. 321. *Carpolobia versicolor*, G. Don, Gard. Dict. i. 370. *B. leptostemma*, Baillon in Adans. vi. 214 (adnot.).

Upper Guinea. Sierra Leone, *Afzelius! Don, Kirk.* Fernando Po, *Barter! Mann!* Guinea proper, *Thonning, Brass! Don!* and others.
This is the *Camwood* of Sierra Leone and the plant of the Afzelian herbarium; but Afzelius has mistaken a branch with several simple leaves for a pinnate leaf.

6. **B. angolensis,** *Welw. mss.* A tree, 15–20 ft. high with slender terete glabrous branches. Petioles 2–3 lines; leaves subcoriaceous

glabrous ovate acute reaching 2–3 in. long. Flowers usually solitary, very rarely geminate, from the old branches, on very slender erecto-patent glabrous pedicels 9–12 lines long. Calyx 6–7 lines, membranous, glabrous, with a pair of minute round adpressed blunt bracteoles at the base, splitting down to the base when the corolla expands. Corolla 6–7 lines, white; orbicular standard $\frac{5}{8}$ in. broad. Ovary linear, glabrous. Pod unknown.

Lower Guinea. Highlands of Golungo Alto, *Dr. Welwitsch!*

7. **B. Kirkii,** *Baker.* An erect shrub, the main branches terete, the young ones densely clothed with yellowish-brown tomentum. Petioles 1 in. long, slightly tomentose; leaves ovate, 2–3 in. long, acute, the base subcuneate, thin, subcoriaceous, upper surface quite glabrous when mature, lower a little tomentose. Flowers 6–9 in lax long-stalked axillary racemes. Bracts linear-oblong, 5–8 lines long, scarious, striated, deciduous. Lower pedicels ascending 4–6 lines long, the upper ones much shorter. Calyx 3–4 lines deep, membranous, glabrous, with a pair of small deciduous membranous tomentose bracteoles at the base. Corolla slightly exceeding the calyx, the standard suborbicular, $\frac{3}{8}$–$\frac{5}{8}$ in. broad, equalling the wings and keel. Ovary sessile, linear, slightly silky, 4-ovulate. Pod not seen.

Mozamb. Distr. Zanzibar, *Dr. Kirk.*

8. **B. maxima,** *Baker.* An erect shrub 10 or 12 ft. high with thick woody branches which are finely grey-downy when young. Petioles 2–4 in. long, glabrous; leaves oblong, 6–7 in. long, 4–5 in. broad, blunt or acute, the base broadly rounded, subcoriaceous, glabrous. Flowers in a close slightly compound panicle amongst the leaves; pedicels downy, 3–4 lines long; bracteoles 2 lines deep, sometimes reflexed; calyx coriaceous, $\frac{1}{2}$–$\frac{5}{8}$ in. deep, densely grey-downy. Corolla 1 in. deep, standard roundish, $\frac{3}{4}$ in. broad. Pod subligneous, 4–5 in. long, $\frac{3}{4}$–$\frac{7}{8}$ in. broad, narrowed to both ends, glabrous, the upper suture flattened, and with a slightly raised line on both sides.

Upper Guinea. Banks of the Cameroon river, *Mann!*

9. **B. spathacea,** *Hook. f. Fl. Nigr.* 320. A tree 20–25 ft. high, the branches moderately stout, terete, slightly adpressed-brown-silky. Petioles firm, glabrous, $\frac{1}{2}$–1 in. long; leaves 4–6 in. long, oblong, acuminate, the base rounded, coriaceous, glabrous. Flowers in a slightly compound panicle which is either lax or moderately close, amongst or above the leaves. Pedicels erecto-patent, densely ferruginous, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Calyx $\frac{1}{2}$ in. deep, coriaceous, densely ferruginous-silky. Bracteoles ovate, $1\frac{1}{2}$–2 lines deep, reflexed. Corolla yellow, about equalling the calyx. Pod 1–$1\frac{1}{4}$ in. long, $\frac{1}{2}$ in. broad, subfalcate, the valves rigid, coriaceous, grey-silky. Seeds 2–3.

Upper Guinea. Niger country, *Ansell! Barter! Mann!* Fernando Po, *Barter!*

10. **B. pubescens,** *Hook. f. Fl. Nigr.* 320. A tree about 20 ft. high, the ultimate branches slender, terete, densely brown-silky. Petioles

$\frac{3}{8}$–$\frac{1}{2}$ in. long, slender, ferruginous; leaves oblong or narrow-obovate, 3–4 in. long, acuminate, the base cuneate or slightly rounded, subcoriaceous, under surface ferruginous on the veins when young. Pedicels 1–4 together from the main branches, $\frac{1}{4}$ in. long, erecto-patent, ferruginous-downy. Bracteoles minute, rounded. Calyx $\frac{1}{4}$ in. deep, finely ferruginous-downy. Corolla twice as long as the calyx, white; standard roundish, $\frac{1}{2}$ in. broad. Pod straight, 3 in. long, $\frac{3}{4}$ in. broad, membranous, rigid, glabrous, brown, polished, narrowed to both ends.—*B. laurifolia*, Baillon in Adans. vi. 213.

Upper Guinea. Guinea proper, *Vogel! Barter! Griffon du Bellay (fide Baillon).*

83. **LEUCOMPHALUS**, Benth. et Hook. f. Gen. Plant. i. 553.

Calyx ovoid, shortly toothed, membranous, slitting as the flower expands down to the base along a single line. Petals subsessile; standard broad-obovate; wings linear-oblong; petals of the keel broader than the wings, not at all connate. Stamens free; anthers linear, longer than their filaments. Ovary long-stalked, pauciovulate; style incurved, subulate; stigma small, terminal. Pod long-stalked, falcate-ovate, turgid, coriaceous, two-valved, glabrous within. Seeds 1 or 2.

A single species, restricted to West Tropical Africa.

1. **L. cappariodeus,** *Benth. Fl. Nigr.* 322, t. 31. A small tree 15 ft. high with slender terete glabrous branches. Petioles $\frac{1}{2}$–1 in. long, slender, glabrous; leaves simple oblong, 3–4 in. long, cuspidate, the base rounded, subcoriaceous, glabrous. Flowers in a slightly compound terminal panicle. Pedicels $\frac{1}{8}$–$\frac{1}{4}$ in. long, glabrous. Bracteoles small, rounded. Calyx 3–4 lines deep, green, membranous, glabrous. Corolla white, equalling the calyx. Anthers linear, $2\frac{1}{2}$ lines long, the filaments very short. Pod $\frac{3}{4}$ in. long by nearly as broad, the valves coriaceous, rigid, glabrous, the small point decurved, the pedicel half as long as the body of the pod.

Upper Guinea. Fernando Po, *Vogel!* Sierra del Crystal, *Mann!*

84. **CAMOENSIA**, Welw.; Benth. et Hook. f. Gen. Plant. i. 557.

Calyx turbinate, with imbricated lobes. Petals papilionaceous with long claws, the standard orbicular, the others narrower, all free. Stamens free; anthers uniform, linear, versatile. Ovary stipitate, multiovulate; style filiform, involute in the unexpanded flower; stigma terminal, small, capitate. Pod broad-linear, flattened, coriaceous, two-valved.—Wide-climbing shrubs with digitately trifoliolate leaves.

Two species, both confined to West Tropical Africa.

Calyx an inch long . . . . . 1. *C. brevicalyx.*
Calyx 6–7 in. long . . . . . 2. *C. maxima.*

1. **C. brevicalyx,** *Benth. in Linn. Trans.* xxv. 302. A woody climber 30 ft. long with firm terete glabrous branches. Petioles 3–4

in. long, firm, glabrous; leaves digitately trifoliolate; leaflets on petiolules ¼ in. long, oblong or with a slight obovate tendency, 4–7 in. long, subacute, the base cuneate or a little rounded, coriaceous, glabrous, upper surface glossy, the main veins raised. Flowers in stalked erecto-patent racemes 6–12 in. long from the axils of the leaves. Pedicels ½–¾ in. long, erecto-patent, with a pair of small ovate spreading bracteoles at the apex. Calyx an inch deep, turbinate, coriaceous, slightly downy, turning black when dried, the five teeth all broad-deltoid, ¼ in. deep. Corolla 2 in. deep, standard 1¼ in. broad. Ovary linear, multiovulate, straight, glabrous, with a slightly raised line along the edge both above and below. Ripe pod not seen.

Upper Guinea. Gulf of Guinea. 1° N. lat., *Mann!*

2. **C. maxima,** *Welw.; Benth. in Linn. Trans.* l.c. t. 36. A woody climber with terete glabrous branches. Stipules rigid and subspinescent. Petioles 2–2½ in. long; leaves digitately trifoliolate, the leaflets with very short petiolules and linear stipellæ, obovate-oblong, 5–6 in. long, narrowed below the middle, cuspidate, subcoriaceous, glabrous. Flowers in short-stalked 6–8-flowered axillary racemes; pedicels 1–2 in. long, downy; bracts and bracteoles lanceolate. Calyx densely coated with reddish woolly tomentum, tubular, 6–7 in. long, the stamens inserted halfway up, slit into five lanceolate segments 1–1½ in. deep, which are finally recurved. Petals cream-coloured, with deeper coloured veins and a golden border, edges crisped and crenulated, the standard protruding 4 in. beyond the calyx, its limb suborbicular, 3–4 in. broad; the other petals shorter and not more than an inch broad. Pod 6–8 in. long, 1–1½ in. broad, nearly straight, clothed with ferruginous woolly tomentum, 3–4-seeded.

Lower Guinea. Congo, *Prof. C. Smith!* (not Sierra Leone, *Afzelius*, as given by mistake in Linn. Trans.). Angola, common in the forests of Golungo Alto, *Dr. Welwitsch!*

A magnificent species, much the most striking plant of the Suborder.

85. **CALPURNIA,** E. Meyer; Benth. et Hook. f. Gen. Plant, i. 554.

Calyx-teeth broad, short, the two upper ones connate. Standard suborbicular, erect or recurved; wings falcate-oblong; keel incurved, obtuse, its petals united along the back. Stamens free, the anthers versatile, often small. Ovary stipitate, multiovulate; style incurved, subulate; stigma terminal, capitate. Pod linear, flattened, membranous, indehiscent, narrowly winged along the upper suture.

A small genus, restricted to the Cape, except this species.

1. **C. aurea,** *Baker.* An erect shrub 10–15 ft. high with slender thinly adpressed grey-silky branches. Petioles slender, ½–1 in. long; rachis of the leaves 3–4 in. long; leaflets 13–21, opposite, short-stalked, elliptical, 1–1¾ in. long, bluntly rounded at both ends, not coriaceous, the under surface slightly silky when young. Flowers in copious

12–20-flowered erecto-patent axillary racemes about equalling the leaves. Pedicels $\frac{1}{2}$–$\frac{5}{8}$ in. long, slender, spreading, with a minute ovate bract at the base. Calyx 4–5 lines deep, membranous, obliquely campanulate, glabrous or slightly silky, the teeth reaching a third of the way down, the upper blunt, the lower ones deltoid. Corolla bright yellow, twice as long as the calyx. Pod 3–4 in. long, $\frac{5}{8}$ in. broad, membranous, short-stalked, acute, the valves finally glabrous, the upper suture with a narrow erect wing under 1 line broad. Seeds 5–6.—*Virgilia aurea*, Lam., DC. Prod. ii. 98; A. Rich. Fl. Abyss. i. 234. *Podalyria aurea*, Willd. Sp. Pl. ii. 502. *Robinia subdecandra*, L'Herit. Stirpes, t. 75. *Calpurnia lasiogyne*, E. Meyer, Com. 2; Harv. et Sond. Fl. Cap. ii. 267.

Nile Land. Abyssinia, *Schimper! Quartin-Dillon and Petit. Roth!*
Native name, Hezautz. A showy shrub, often cultivated.
Lower Guinea. Highlands of Huilla, and Golungo Alto, *Dr. Welwitsch!*

86. **SOPHORA**, Linn.; Benth. et Hook. f. Gen. Plant. i. 555.

Calyx-teeth short. Standard obovate or orbicular, erect or spreading; wings oblong, oblique; keel oblong, nearly straight, its petals usually imbricated or coherent along the back. Stamens perigynous or nearly hypogynous, free or rarely slightly connate at the base; anthers versatile. Ovary short-stalked, multiovulate; style incurved; stigma minute, terminal. Pod moniliform, terete or slightly compressed, coriaceous and indehiscent in our species. Cotyledons thick, the radicle sometimes straight and short, sometimes longer and inflexed.—Trees or shrubs with imparipinnate leaves.

A moderately small genus, dispersed through the Tropics.

Calyx with the stamens from the base.
- Petals very narrow, not imbricated . . . . . 1. *S. zambesiaca.*
- Petals imbricated, those of the keel connate . . . . . 2. *S. tomentosa.*

Calyx with the stamens from a third of the way up . . . . . 3. *S. oligophylla.*

1. **S.? zambesiaca,** *Baker.* A tree of moderate size, the branchlets slender, woody, terete, finely grey-downy. Petioles $\frac{1}{2}$ in. long, rachis 3 or 4 in., both grey-downy; leaflets 11–15, the lateral ones alternate, on petiolules a line long, the upper ones oblong, $1\frac{1}{4}$–$1\frac{1}{2}$ in. long, bluntish, the base slightly rounded, subcoriaceous, upper surface glossy with raised veinlets, lower paler, the veinlets also raised, the midrib a little downy. Flowers in 12–20-flowered axillary and terminal racemes $1\frac{1}{2}$–2 in. long, the lateral ones in our specimen simple, the terminal one slightly compound. Pedicels $1\frac{1}{2}$–2 lines long, downy, not bracteated. Calyx campanulate, truncate, grey-downy, $\frac{1}{8}$ in. broad and deep. Corolla $\frac{1}{2}$ in. long, the petals distant, the standard $\frac{1}{8}$ in. and the other petals not more than a line broad. Ovary stipitate, linear, densely grey-silky, with 4 or 5 ovules. Fruit a 1-seeded drupe.

South Central. Highlands of the Batoka country, *Dr. Kirk!*
This does not agree with *Sophora* in the petals, but we have not seen good flowers,

and the structure of the fruit is uncertain. The pod has probably often more than one seed developed, but whether in that case it is moniliform we cannot say.

2. **S. tomentosa,** *Linn.; DC. Prod.* ii. 95. A robust erect shrub, 10–15 ft. high, the branchlets densely argenteous. Petiole an inch long; rachis 4–8 in.; leaflets 15–19, nearly sessile, oblong, 1½–2 in. long, slightly mucronate, the base slightly rounded, subcoriaceous, both sides densely and permanently coated with adpressed grey-silvery tomentum. Flowers in lax 12–30-flowered axillary and terminal racemes. Pedicels ¼–½ in. long, argenteous, with a lanceolate or linear bract at the base. Calyx campanulate, 3–4 lines deep, subtruncate, argenteous. Corolla bright yellow, ¾ in. deep. Pod 5–6 in. long, with 5–8 coriaceous globes 3–4 lines thick, connected by narrow necks.—*S. crassifolia,* Duham, and *S. littoralis,* DC. ii. 95. *S. nitens,* Schum. et Thonn. Pl. Guin. 201. *S. inhambanensis,* Klotzsch in Peters' Mossamb. Bot. 26.

Upper Guinea. Guinea proper, *Thonning, Vogel!* Sierra Leone, *Afzelius!*
Mozamb. Distr. Sofala, *Dr. Peters!* Zambesi land, *Dr. Kirk!*
Extends southward to Natal, and widely diffused through Tropical Asia and America.

3. **S. oligophylla,** *Baker.* A shrub 3–4 ft. high with firm woody terete glabrous branches. Petioles 1–1¼ in. long, firm, glabrous; rachis 3 in. long; leaflets 5, oblong, 6–8 in. long, 2½–3 in. broad, with a long cuspidate point, the base rounded, the lateral ones alternate, on indurated petiolules 2 lines long, coriaceous, glabrous, the main veins raised beneath. Flowers in dense 12–20-flowered capitate racemes not more than an inch deep. Pedicels 2 lines long, slender, fragile, articulated above the middle. Calyx ⅜ in. deep, the stamens adnate to it one-third of the way up, and the calyx expanded and curved at the point, from which they spring, thin but tough in texture, quite glabrous, with a shallow slit at the apex and three small deltoid teeth below. Corolla an inch long, the standard ⅜ in. broad, completely enveloping the rest of the flower, the other petals not more than a line broad, those of the keel close but not connate. Pod 3–4 in. long, 6–7 lines thick, distinctly stalked, glabrous, carnoso-coriaceous, 2–4-seeded, the necks sometimes obliterated.

Upper Guinea. Old Calabar, *Mann!*

87. **ORMOSIA,** Jacks; Benth. et Hook. f. Gen. Plant. i. 556.

Calyx campanulate with the two upper teeth subconnate and often incurved. Standard suborbicular; wings oblique, obovate-oblong; keel with the petals free. Stamens free, unequal, all or all but one or two perfect; anthers versatile. Ovary subsessile, bi- or multiovulate; style filiform, involute at the apex; stigma introrse, lateral. Pod oblong or rarely linear, compressed, coriaceous, fleshy or woody, not winged, 2-valved, continuous or septate between the seeds.—Trees with imparipinnate or abruptly pinnate leaves, coriaceous leaflets and flowers in copious terminal panicles or racemes.

A small genus, stretching round the world in the Tropics.

Standard shorter than the wings and keel . . . . . 1. *O. laxiflora.*
Standard as long as the wings and keel . . . . . 2. *O. angolensis.*

1. **O. laxiflora,** *Benth. in Herb. Kew.* A tree 40 ft. high, with very hard wood, the branches finely grey-downy. Petioles 1–1½ in. long; leaves 5–6 in. long, with 9–11 oblong glabrous coriaceous pointed leaflets 2–3½ in. long, on petiolules 2–2½ lines long. Flowers in copious nearly sessile thyrsoid panicles with racemose branches. Pedicels 4–5 lines long, finely grey-downy. Calyx coriaceous, 4 lines deep, finely grey-velvety, finally breaking away from the disk, the teeth reaching three-quarters of the way down, the three lower ones lanceolate. Corolla greenish, 6–7 lines deep, the standard orbicular, ⅔ in. broad, recurved, considerably shorter than the other petals, which are all 2–2½ lines broad. Ovary linear, silky, stalked. Pod unknown.

Upper Guinea. Nupe, *Barter!* Jeba, *Dalton!* Cameroons river, *Mann!*

2. **O. angolensis,** *Baker.* A shrub reaching 8 ft. high, with densely brown-velvety branches. Petiole 15–18 lines; rachis 4–5 in., both densely brown-velvety; leaflets 7–9, coriaceous, glabrescent above, thinly brown-velvety below, oblong, blunt, emarginate at the point; the end one the largest, 1½–2 in. long; side ones alternate. Flowers in ample terminal thyrsoid panicles, with densely brown-velvety branches. Pedicels ¼–⅜ in., with minute linear deciduous bracteoles. Calyx campanulate, coriaceous, densely velvety, ⅜ in. long; teeth oblong-lanceolate, reaching halfway down. Corolla ½ in., reddish; petals subequal, much veined; standard round, ⅝ in. broad. Ovary linear, densely silky, pauciovulate. Pod not known.

Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*

88. **CADIA,** Forsk.; Benth. et Hook. f. Gen. Plant. i. 560.

Calyx campanulate with broad subequal teeth. Petals uniform, free, erecto-patent, obovate or suborbicular, shortly unguiculate, the upper one outermost in æstivation. Stamens free, subequal, rather shorter than the petals; anthers uniform, linear, versatile. Ovary subsessile or stipitate, multiovulate; style incurved, subulate; stigma small, terminal. Pod linear, acuminate, flattened, coriaceous, two-valved, continuous within.—Erect shrubs.

Only two species known, restricted to Arabia and Tropical Africa.

1. **C. varia,** *L'Herit.; DC. Prod.* ii. 486. A small shrub, the ultimate branches slender, woody, finely downy. Leaves subsessile; rachis 3–4 in. long, leaflets in 15–25 pairs and a terminal one, alternate, sessile, ligulate, 6–8 lines long, a line broad, coriaceous, the upper surface green, the lower glaucous, edges revolute. Flowers solitary or in 2–4-flowered cymes on downy peduncles an inch or less long. Pedicels 1 in. long, slender, pendulous. Calyx ½ in. deep, membranous, glabrous or

slightly silky; teeth deltoid, reaching about halfway down. Corolla reddish-violet, 1 in. deep, veiny, its petals obovate, uniform, much imbricated, $\frac{1}{2}$–$\frac{5}{8}$ in. broad. Pod linear, glabrous, nearly straight, narrowed to a point, with a stalk equalling the calyx.—A. Rich. Fl. Abyss. i. 248. t. 46. *C. purpurea*, Willd. Sp. Pl. ii. 548. *Spaendoncea tamarindifolia*, Desf. dec. phil. vii. 259. *Panciatica purpurea*, Picciv. Hort. Panc. 9 cum icone.

Nile Land. Abyssinia, *Salt! Quartin-Dillon and Petit! Roth!*
Also a native of Arabia.

In the other species, the Mascarene *C. pubescens*, Bojer, the leaflets are 4 lines broad, and the calyx is three quarters as long as the corolla.

89. **BAPHIOPSIS,** Benth. mss.

Calyx small, oblong, membranous, without a disciferous tube, at first closed and entire, splitting irregularly when expanded. Petals six, about equalling the calyx, oblong, nearly equal. Stamens 16–18, almost hypogynous, not more than half as long as the calyx and corolla, the anthers oblong, the filaments filiform, varying from as long as the anthers to twice as long. Ovary sessile, biovulate, linear, glabrous, narrowed into a very much hooked style which exceeds it and about equals the petals; the stigma minute, capitate. Pod unknown.—A large tree with small flowers in racemes or umbels from the woody branches.

Habit of *Baphia*, from which the number of stamens and character of the petals separate it. It comes nearest *Aldina* in technical characters, but this has a disk to the calyx, a large showy corolla, perigynous indefinite stamens, linear anthers, and imparipinnate leaves.

1. **B. parviflora,** *Benth. in Herb. Kew.* A tree 40 or 50 ft. high with glabrous terete grey woody slender ultimate branches. Stipules none or deciduous. Petioles 6–15 lines long, woody, glabrous, incrassated at the base and apex. Leaves oblong, 6–8 in. long by less than half as broad, acute, entire, base rounded, coriaceous, colour pale-green, both sides quite glabrous, the veinlets finely reticulated and raised on both sides. Flowers in umbels or abbreviated racemes of a dozen each on slender pedicels 3 or 4 lines long. Bracteoles minute, ovate, scarious, striated, deciduous. Bud oblong, acute, 2 lines long.

Upper Guinea. Ambas bay, *Mann!*

90. **SWARTZIA,** Schreb.; Benth. et Hook. f. Gen. Plant. i. 561.

Calyx without a disciferous tube, at first globose and entire, splitting variously as the flower expands. Corolla with one petal in our species but sometimes with none or three. Stamens indefinite, free or shortly connate at the base, almost hypogynous, declinate and ascending, the filaments filiform; anthers uniform or some larger, fastened near the base, the dehiscence longitudinal. Ovary stipitate, often incurved, multiovulate, narrowed into the style; the stigma terminal, small, rarely capitate. Pod ovoid or elongated, turgid or subterete, coriaceous or

fleshy, two-valved or indehiscent.—Unarmed erect trees with imparipinnate or simple leaves.

A large genus; all the other species Tropical American.

1. **S. madagascariensis,** *Desv. in Ann. Sc. Nat. Sér.* i. ix. 424. A tree 20–30 ft. high, the branchlets woody, slender, glabrous or a little silky. Petiole an inch long; rachis 4–6 in.; leaflets 9–11, the lateral ones alternate on petiolules a line long, oblong, 2–3 in. long, blunt, coriaceous, upper surface green, glabrous, lower clothed with fine grey or subferruginous silky tomentum. Flowers solitary or in few-flowered irregular racemes, the pedicels firm, slender, spreading or deflexed, $1\frac{1}{2}$–2 in. long, densely silky, thickened below the flower; bud globose, densely adpressed silky, 4 lines in diameter. Calyx splitting down to the base as the flower expands, finally spreading or deflexed. Petal orbicular, an inch deep, silky on the back. Anthers mostly small, ovate or subglobose, the outer ones larger oblong. Pod sometimes a foot long, $\frac{1}{2}$–$\frac{3}{4}$ in. thick, cylindrical, slightly furrowed, coriaceous, brown, the space between the pericarp and woody endocarp filled by transverse partitions enclosing gummy matter.—*S. marginata*, Benth. in Hook. Journ. Bot. ii. 87.

Upper Guinea. Nupe, *Barter!*
North Central. Banks of Lake Tschad, *E. Vogel!*
Nile Land. Madi, *Speke and Grant!* Wood very hard, deep red.
Lower Guinea. Highlands of Huilla, *Dr. Welwitsch!*
South Central. Batoka Highlands, *Dr. Kirk!*
Mozamb. Distr. Maravi country, west of Lake Nyassa, *Dr. Kirk!*

91. CORDYLA, Lour.; Benth. et Hook. f. Gen. Plant. i. 562.

Stamens inserted high up in the calyx, which is entire and turbinate in bud, splitting as the flower expands into four or five irregular divisions. Petals none. Stamens indefinite, free or very slightly connate at the base, the filaments filiform; anthers small, ovate, subuniform, dehiscing longitudinally. Ovary long-stalked, multiovulate; style short, subulate; stigma small, terminal. Pod ovoid, acuminate, pulpy, with a coriaceous pericarp. Seeds few.

A single species, confined to Tropical Africa.

1. **C. africana,** *Lour.; DC. Prod.* ii. 521. A tree sometimes 12 ft. in circumference, the bark grey-corky, the branchlets slender, woody, glabrous or slightly grey-villous. Petiole an inch long; rachis 6–9 in.; leaflets in 9–12 pairs and a terminal one, the former not quite opposite on petiolules 2 lines long, ovate or oblong, $1\frac{1}{2}$–2 in. long, base rounded, apex blunt, subcoriaceous, both sides glabrous or the midrib beneath a little downy. Flowers in copious 6–12-flowered racemes 1–2 in. long. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. long, glabrous or downy. Calyx coriaceous, 5–6 lines deep, glabrous or more or less grey-downy, slit down into deltoid lobes to where the stamens are inserted, which is about halfway down. Stamens 30–35, $\frac{1}{2}$ in. long, the filament yellow, mem-

branous, flattened. Pod distinctly stalked, at first green, finally as large as a lemon, yellow and pulpy within, edible, in our specimens 2-seeded.—Klotzsch in Peters' Mossamb. Bot. 17, t. 4. *Calycandra pinnata*, A. Rich. in G. et P. Fl. Seneg. 31, t. 9. *Cordylia africana*, Pers. Ench. ii. 260.

Upper Guinea. Senegambia, *Leprieur!*
Nile Land. Gondokoro, *Speke and Grant!*
Mozamb. Distr. Zambesi land and Sofala, *Dr. Peters, Dr. Kirk! Dr. Meller!*

Suborder II. Cæsalpinieæ. (By Prof. Oliver.)

Flowers irregular, more rarely regular, 5-merous. Sepals 5, 2 posterior sometimes coherent throughout, connate below or free to the base, imbricate or rarely valvate, occasionally spathaceous, rarely obsolete or reduced to minute scales. Petals 5 or fewer by abortion or 0, posterior included in æstivation. Stamens 10 or fewer by abortion, rarely more, free or mon- or diadelphous; anthers various. Ovary sessile or stipitate, stipes often adnate to the calyx-tube. Seed various, with or without albumen.—Trees, shrubs, or rarely herbaceous. Leaves alternate, usually pinnate (leaflets alternate or uni-multijugate) or bipinnate, more rarely unifoliolate or simple. Inflorescence very various.

Of the 78 or 80 genera included in this Suborder, 33 are represented in Tropical Africa. Of these 12 or 13 are peculiar.

Tribe 1. **Eucæsalpinieæ.**—*Leaves bipinnate. Calyx divided to the disk. Petals usually* 5, *subequal or but slightly unequal. Stamens* 10 (*or fewer in* Gleditschia).

Legume indehiscent flat oval or oblong, with wing-like margin on each side. Stigma peltate	1. Peltophorum.
Legume indehiscent or nearly so, compressed, ventral suture only winged or dilated. Base of calyx-tube very oblique	2. Mezoneurum.
Legume 2-valved. Calyx-lobes imbricate	3. Cæsalpinia.
Legume 2-valved, thinly coriaceous, glandular-setulose. Calyx-lobes subvalvate	4. Hoffmanseggia.
Legume 1-seeded samaroid	5. Pterolobium.
Legume indehiscent or tardily dehiscent. Flowers small, densely spicate. Petals narrow	6. Gleditschia.
Legume 2-valved. Flowers large. Calyx-lobes valvate. Petals clawed with rounded lamina	7. Poinciana.
Legume narrow-linear, usually torulose, scarcely dehiscent	8. Parkinsonia.

Tribe 2. **Cassieæ.**—*Leaves simply pinnate. Sepals* 5, *distinct or calyx-lobes free to the disk. Petals* 5 *or fewer or* 0. *Stamens* 2–10, *anthers basi- or dorsifixed.*

Leaves imparipinnate. Petals 5. Stamens 4; anthers dehiscing longitudinally near the apex, 2 posterior connate	9. Oligostemon.
Leaves abruptly pinnate. Petals 5. Stamens 10, all perfect, or 3 or 5 effete; anthers dehiscing by pores or longitudinally	10. Cassia.
Leaves imparipinnate. Petals 3. Stamens 2, anthers dehiscing by oblique pores. Staminodes 3	11. Distemonanthus.
Leaves imparipinnate. Petals 2, 1, or 0. Stamens 2, anthers dehiscing longitudinally. Staminodes 0.	12. Dialium.

Tribe 3. **Bauhinieæ.**—*Leaves simple, or 2-foliolate with more or less connate leaflets.*

Leaves simple, penniveined, at least above. Calyx-tube elongate, campanulate above, 5-toothed . . . . . 13. Bandeiræa.
Leaves 2-foliolate, leaflets more or less connate sometimes throughout, forming an apparently simple 5–11-nerved leaf. Calyx-limb 5-toothed -partite or spathaceous . . . . . 14. Bauhinia.

Tribe 4. **Amherstieæ.**—*Leaves simply pinnate, occasionally 2-foliolate. Calyx-lobes free to the disk, or perianth reduced to scales or obsolete. Petals* 5 *or fewer or* 0. (*See also* Cynometreæ).

Bracteoles present at flowering, opposite, valvate, enclosing the bud until expansion.
Calyx obvious.
Petals 5, subequal, posterior rotundate or obcordate, narrowed below, or post. petal with distinct claw, the rest smaller. Stamens 10 or 5. Calyx-lobes 5. Leaves abruptly pinnate . . . . . 15. Berlinia.
Posterior petal much exceeding the rest or the 2 anterior. Perfect stamens 3. Calyx-lobes 4 or 5. Leaflets 1–6-jugate . . . . . 16. Macrolobium.
Posterior petal oblong entire sessile, rest evanescent or 0. Perfect stamens 10, free . . . . . 17. Daniellia.
Posterior petal larger, clawed, rest minute or 0. Perfect stamens 7, slightly coherent at base . . . . . 18. Afzelia.
Calyx rudimentary or obsolete.
Petal 1. Stamens 3 or 2. Ovules 2–4 . . . . . 19. Cryptosepalum.
Petals 0 or squamiform.
Stamens 10–13, more or less connate below. Ovules 5–8. Leaflets 3–20 pairs . . . . . 20. Brachystegia.
Stamens 5. Ovules ∞. Leaves 2-foliolate . . . . . 21. Didelotia.
Bracteoles small, caducous, or, if persistent, not enclosing the bud.
Leaflets multijugate. Anterior petals 2, minute. Fertile stamens 3, connate below . . . . . 22. Tamarindus.
Leaflets 2–1-jugate. Flowers very large. Petals 5, subequal, much exceeding calyx. Stamens 10, posterior free . . . 23. Baikæa.
Leaflets about 2–4-jugate. Petals 5, shorter than or but slightly exceeding calyx. Stamens 10 . . . . . 24. Schotia.
Leaflets 1-jugate. Petals 5, subequal or anterior squamiform. Stamens 10 . . . . . 25. Trachylobium.
Leaves imparipinnate, 4–7-foliolate. Stamens 10 or fewer . 26. Crudya.

Tribe 5. **Cynometreæ.**—*Leaves abruptly pinnate. Calyx-lobes free to the disk. Petals* 0, 1, *or* 5. *Ovules* 1–4.

Calyx obvious.
Calyx-lobes 4, subvalvate. Petals 0. Stamens 10. Ovary sessile. Leaflets 6–12 . . . . . 27. Detarium.
Calyx-lobes 4, imbricate. Petals 0. Stamens 10. Ovary shortly stipitate. Leaflets 2 . . . . . 28. Copaifera.
Calyx-lobes 5, imbricate. Petals 0. Stamens 10. Leaflets 2–4 . . . . . 29. Hardwickia.
Calyx-lobes 4, imbricate. Petals 5, or 2 anterior minute. Stamens 10. Leaflets 1–6-jugate . . . . . 30. Cynometra.
Calyx rudimentary. Petal 1. Leaflets 1-jugate . . . . . 31. Aphanocalyx.

Tribe 6. **Dimorphandreæ.**—*Leaves 2-pinnate. Flowers small subregular. Calyx campanulate, 5-fid. Petals* 5.

Legume flat, indehiscent. Ovules 1–2 . . . . . 32. Burkea.
Legume follicular or 2-valved. Ovules 5–8 . . . . . 33. Erythrophlæum.

1. **PELTOPHORUM,** Vogel; Benth. et Hook. f. Gen. Plant. i. 565.

Sepals 5, united at the base into a short obconical tube, lobes imbricate, nearly equal. Petals obovate or orbicular, narrowed below, undulate. Stamens 10, free, filaments densely pilose within at the base; anthers uniform, linear-oblong. Ovary sessile or very shortly pedicellate, with 2 or more ovules; style elongate; stigma broadly peltate. Legume flat, oblong or oval, indehiscent, valves consolidated around the median cavity forming a wing on each side, usually longitudinally striate, 1–few-seeded. Seeds oblong, compressed, albuminous (in the African species); cotyledons flat, radicle ovoid, straight, partly exserted.—Trees, destitute of prickles. Leaves twice pinnate; leaflets numerous. Flowers yellow in erect single or panicled bracteate racemes.

A small genus, represented in both hemispheres. The following is the only African species.

1. **P. africanum,** *Sond. in Linnæa*, xxiii. 35. A tree of 20–30 ft. (in Angola, *Dr. Welwitsch*); leafy extremities rusty-pubescent or tomentose. Pinnæ usually in 5–10 pairs, opposite or subopposite; leaflets in 10–20 pairs on the upper or median pinnæ, oblong, mucronulate, thinly pubescent or glabrate above, paler with adpressed pubescence beneath, base slightly oblique, sessile, 2–3 lines long. Racemes erect, slightly overtopping the leaves, 4–7 in. long, shortly tomentose-pubescent. Bracts subulate, shorter than or nearly equalling the pedicels, sometimes caducous. Calyx-tube short, obconical, glabrous within, as are the reflexed ovate-oblong obtuse lobes. Petals obovate or rotundate, much narrowed, and sometimes pilose on the median line below. Filaments densely pilose at the base inside. Ovary subsessile, adpressed-hirsute; style recurved, glabrous above; ovules about 3. Fruit much compressed, coriaceous, oblong, tapering to each end, puberulous or glabrate, with longitudinal anastomosing striæ, excepting along the winglike margin; $2\frac{1}{2}$–3 in. long, $\frac{2}{3}$–1 in. broad, 1–2-seeded.

Lower Guinea. Mossamedes and Huilla, Angola, *Dr. Welwitsch!*
South Central. Near Lake Ngami, *J. M'Cabe!*
Occurs also in the Macalisberg, south of the Tropic.

2. **MEZONEURUM,** Desf.; Benth. et Hook. f. Gen. Plant. i. 565.

Calyx-tube short, very oblique, segments 5, broadly imbricate, deciduous, the anterior segment larger, concave or hooded, exterior and enclosing the rest in bud. Petals 5, rather unequal. Stamens 10, free; filaments glabrous or pilose below; anthers uniform, elliptical or oblong, dehiscing longitudinally, connective slightly thickened behind. Ovary sessile or shortly stipitate with 2 or more ovules; style subulate; stigma terminal, truncate or dilated-infundibuliform. Legume indehiscent or nearly so, more or less coriaceous, much compressed, ventral suture only longitudinally winged or dilated. Seeds 1–∞, compressed,

exalbuminous, with a thick testa.—Climbing shrubs or trees, usually prickly. Leaves ample, bipinnate. Flowers in terminal or axillary solitary or panicled racemes. Bracts subulate, early caducous.

Confined to warm regions of the Old World. The following species appear to be endemic, though *M. Benthamianum* and *M. angolense* are perhaps too nearly allied to *M. enneaphyllum* (W. et A.), and one or two other Indian species.

Legume 2½–3½ in., wing thin.
  Pinnæ 5–6 pairs, leaflets 10–12 to each . . . . . 1. *M. Benthamianum.*
  Pinnæ 8–10 pairs, leaflets 12–18 to each . . . . . 2. *M. angolense.*
Legume 1–1½ in., ventral suture thickened coriaceous. Pinnæ
  15–20, multifoliolate . . . . . 3. *M. Welwitschianum.*

1. **M. Benthamianum,** *Baill. in Adans.* vi. 196. A climbing glabrous shrub or extremities puberulous or hoary, more or less armed with short recurved prickles which occur also on the rachis of the leaves and sometimes of the inflorescence. Leaves 1 ft. long or more; pinnæ in about 5 pairs, 3–5 in. long; leaflets about 10–12 to each pinna, alternate or subopposite, obovate-elliptical, obtuse, entire or faintly retuse, scarcely oblique at base, glabrous, venation not prominent; ¾–1¼ in. long, 6–9 lines broad, on petiolules of 1 line or less. Racemes stout, dense, many-flowered, erect, simple or branched below, hoary or puberulous. Pedicels spreading or at length reflexed, ½ in. long or less. Filaments pilose below. Ovary shortly tomentose, narrowed into the nearly glabrous curved style; stigma dilated, obliquely concave, papillose round the margin; ovules 4–5. Legumes oval-oblong, obtuse, very flat, glabrate, obscurely reticulate-venose, 2½–3½ in. long, 1–1¼ in. broad; wing of upper suture ¼ in. broad.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone (fruit only), *Oldfield!*

2. **M. angolense,** *Welw.* Agreeing with *M. Benthamianum* in general characters. Pinnæ in 8–10 pairs; leaflets smaller, obovate-elliptical rounded or retuse above, usually 12–18 to each pinna. Racemes less hoary and perhaps not so dense as in *M. Benthamianum.* Legume the same.

Lower Guinea. Golungo Alto and Pungo Andongo, Angola, *Dr. Welwitsch!*

This plant could not fairly be united with *M. Benthamianum*, to which it is very nearly related, without a further consolidation of Indian species, for which our material hardly suffices.

3. **M. Welwitschianum,** *Oliv.* Climbing shrub, extremities rather stout, gradually tapering, aculeate, tawny-pubescent. Leaves 9–18 in. long, rachis pubescent or shortly tomentose; pinnæ in 15–20 pairs, 1½–3 in. long; leaflets opposite or nearly so, 15–22-jugate, oblong, obtuse, subsessile, sparsely or shortly adpressed-pubescent at least beneath, the under surface at length much paler; usually ¼–⅓ in. long, 1 line broad. Racemes terminal or axillary, many-flowered, simple or branched at the base, pubescent or at length glabrate, ½–1½ ft. long. Pedicels sparsely pubescent at first, ½–1¼ in. Buds very oblique at base. Anterior hooded calyx-lobe deep red within. Petals "yellow, scarlet towards the claw, posterior with plicate margins on the inner

face, bicorniculate." Filaments densely pilose below. Ovary very thinly hairy, narrowed into a moderately slender style curved above; stigma truncate, scarcely dilated; ovules about 4. Legume flat, coriaceous, elliptical, 2-seeded, or roundish and 1-seeded, with a minute terminal apiculus, ventral margin broad and thickened, 1–1½ in. long.

Lower Guinea. Golungo Alto (flower) and Pungo Andongo (fruit), Angola, *Dr. Welwitsch!*

3. **CÆSALPINIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 565.

Calyx-lobes 5, imbricate, the lower outside and often larger. Petals 5, orbicular or obovate, nearly equal or the upper smaller. Stamens 10, free; filaments usually pubescent or glandular at the base; anthers uniform, dehiscing longitudinally. Ovary sessile or subsessile, free, inserted at the base of the short calyx-tube; style usually filiform with a terminal truncate, concave, sometimes sinuate stigma; ovules usually few. Legume ovate, elliptical, oblong or falcate, compressed, exalate, coriaceous, 2-valved or slowly dehiscent or indehiscent. Seeds transverse, usually separated by cellular partitions, "exalbuminous," (or albuminous in *C. pulcherrima*), with a short straight radicle.—Trees or shrubs, sometimes climbing, with or without prickles. Leaves bipinnate. Flowers yellow to red, often handsome, in simple or panicled racemes.

A considerable Tropical American and Asiatic genus, with three species, of which *C. Bonducella* is one, extending to Australia.

1.* **C. pulcherrima,** *Sw. Obs.* 166. A small glabrous tree of 10–15 ft.; branches unarmed, often with a glaucous bloom. Leaves bipinnate, ½–1 ft. long, with 4–9 pairs of widely spreading 5–12-jugate pinnæ; rachis unarmed or with minute prickles at the insertion of the pinnæ; leaflets larger towards the extremity of each pinna, obovate or oblanceolate-oblong, very obtuse entire or emarginate, with or without a minute mucro, base very oblique, upper margin rounded from the short distinct petiolule; upper leaflets usually 6–10 lines long. Racemes terminal and from the upper axils, corymbose or pyramidal, exceeding the leaves, bearing numerous very showy scarlet flowers on long (2–3 in.) ascending pedicels. Bracts subulate, falling long before the expansion of the flowers. Calyx-lobes glabrous, much imbricate, the lower overlapping the rest like a hood. Petals usually ½–1 in. long, much narrowed to the base. Filaments filiform, much exserted. Ovary glabrous, narrowed into a long filiform style. Legume coriaceous, flat, usually slightly broader towards the obliquely apiculate apex, 4–8-seeded, 2½–4½ in. long, ⅔–¾ in. broad above. Seeds compressed obovate-quadrate, albuminous.—*Poinciana pulcherrima*, Linn.; DC. Prod. ii. 484.

I have only seen specimens from Sierra Leone, Loanda, and Zanzibar; but it is recorded from various localities, being cultivated throughout the Tropics for the sake of its brilliant flowers. It is believed to be of Asiatic origin.

2. **C. Bonducella,** *Roxb. Fl. Ind.* ii. 357. A scrambling shrub; branches, leaf-rachis and inflorescence pubescent or villous and armed

sparsely or densely with short unequal slightly recurved prickles. Leaves ample, stipulate, 1–1½ ft. long, with about 4–7 pairs widely spreading 5–10-jugate pinnæ; leaflets ovate-elliptical or elliptic-oblong, apex rounded or shortly and broadly pointed with a short fine mucro, base rounded, subsessile, usually at length glabrate or the midrib and margin puberulous, the larger 1–1¾ in. long. Racemes many-flowered, simple or branched below; bracts linear-subulate with a fine recurved point projecting beyond the unopened flowers. Calyx rusty-pubescent, lobes recurved. Petals yellow, spreading, the upper sometimes spotted with red. Legumes 2-valved, 2–3 in. long, 1½–1¾ in. broad, coriaceous, covered with short spreading straight prickles; 1–2-seeded. Seeds subglobose or ovoid, bluish-grey or lead-coloured.—*Guilandina Bonducella*, L.; DC. Prod. ii. 480. (*G. Bonduc*, Ait., β. *minus*.)

Upper Guinea. Senegambia, Cape Palmas, *T. Vogel!* Fernando Po, *Barter!*
Mozamb. Distr. Luabo river, *Dr. Kirk!*

No doubt abundant elsewhere along the African coast, as it is generally on the shores of the Tropics of both hemispheres. *C. Bonduc*, a nearly allied and widely-spread, though less common Tropical species, of which I have not seen African specimens, differs in the absence of stipules, erect bracts, and less degree of pubescence. I presume that the plant recorded under this name from various localities in Tropical Africa is *C. Bonducella*.

4. **HOFFMANSEGGIA**, Cav.; Benth. et Hook. f.

Gen. Plant. i. 567.

Sepals 5, coherent at base in a very short tube, the posterior broader, subvalvate in æstivation (in the African species). Petals 5, lanceolate, rotundate or obovate, posterior smaller. Stamens 10, declinate; anthers uniform, dehiscing longitudinally. Ovary subsessile, 3–∞-ovulate; style rather short or filiform, curved at the tip with an oblique rather dilated stigma. Legume 2-valved, thinly coriaceous, shortly setulose in the African species, few-seeded. Seeds compressed, exalbuminous, with a short straight radicle.—Herbs or low shrubs, frequently glandular. Leaves bipinnate or lateral pinnæ wanting; leaflets small, with or without stipellæ. Flowers yellow or red, racemose, racemes leaf-opposed or terminal, bracts deciduous.

A small genus, chiefly American, with two South African representatives, of which but one occurs between the Tropics.

1. **H. Burchellii,** *Benth. in Hb. Kew.* An ascending or diffuse setulose herb of ½–1 ft. from a woody stock; root-fibres 4–6 in., considerably thickened or fusiform. Leaves 1–3-jugate with a terminal pinna, or lateral pinnæ wanting; when present, usually 4–8-foliolate, terminal pinna (or simply pinnate leaf) 10–20-foliolate, leaflets opposite with minute setaceous stipellæ, oblong or ovate-oblong obliquely rounded at the base, commonly dotted more or less with conspicuous black glands. Racemes several-flowered, erect, nearly equalling or exceeding the leaves, sparsely setulose. Pedicels 1½–2 lines long, recurved above in fruit. Flowers (according to Dr. Burchell) red, the

upper smaller petal with a yellow spot. Legumes obliquely- or falcate-oblong apiculate ¾–1¼ in. long, 4–5 lines broad, usually 3–4-seeded, shortly and rather densely setulose and gland-dotted. Seeds much compressed obovate or quadrate-oblong, smooth or slightly transversely striate. Cotyledons flat, deeply emarginate at base, and closely sheathing the radicles.—*Melanosticta Burchellii*, DC. Mém. Legum. t. 69. Harv. Thes. Cap. t. ii.

South Central. Koobie to N. Shaw valley, *Baines!*

Collected by Dr. Burchell, south of the Tropic. A near ally, *M. Sandersoni*, Harv., grows in the Transvaal.

5. **PTEROLOBIUM**, R. Br.; Benth. et Hook. f. Gen. Plant. i. 567.

Calyx-tube very short, lobes 5, imbricate, the posterior rather larger and embracing the rest. Petals 5, nearly uniform, spreading, oblanceolate or obovate. Stamens 10, nearly uniform; anthers uniform, dehiscing longitudinally. Ovary sessile or shortly stipitate, 1–2-ovulate; style rather short in the African species, with a truncate concave stigma. Fruit samaroid, obliquely-oblong, 1-seeded; wing produced beyond the seed-cavity, thickened on the upper margin with the scar of the style at or very little below the obtuse or acute apex. "Seed pendulous, flattened, exalbuminous; radicle short, straight."—Shrubs or trees often scandent, armed more or less with recurved prickles. Leaves bipinnate; leaflets numerous, small. Flowers whitish in paniculate racemes. Bracts very early deciduous.

A small genus of the Old World Tropics. The following appears to be endemic, though with a near Indian ally.

1. **P. lacerans,** *R. Br. in Salt, Abyss. App.* 64. A shrub or small tree. Branches armed with short recurved stipular and sparsely scattered prickles; extremities minutely puberulous. Pinnæ 8–12 pairs, with recurved prickles on the rachis at their insertion; leaflets 9–14 pairs, oblong, obtuse or subretuse, glabrous or pubescent at least underneath, venation obscure, 3–4½ lines long, on very short petiolules or subsessile. Flowers small whitish in many-flowered rather densely spicate puberulous racemes collected in terminal panicles overtopping the leaves; pedicels patent, often clustered, 1½–3 lines long. Petals nearly uniform oblanceolate but slightly exceeding the calyx-lobes. Ovary very shortly stipitate, 1–2-ovulate; style short and rather thick; stigma truncate, concave. Fruit obliquely oblanceolate-oblong usually obtuse with the scar of the style immediately under the apex, 1½–2 in. long, wing submembranous, with the upper margin thickened, 6–8 lines broad.—*Quartinia abyssinica*, Rich. in Ann. Sc. Nat. Sér. 2. xiv. 260, t. 14. *P. abyssinicum*, Rich. Fl. Abyss. i. 246. *Mimosa? Kantuffa*, Bruce, DC. Prod. ii. 431; Bruce, Abyss. Atlas, t. 14; *Fillæa? Brucei*, Fres. in Flora, 1839, 54.

Nile Land. Abyssinia, *Salt! Schimper!* and others.

Nearly allied to the Indian *P. indicum*, Rich. l.c. (*Cæsalpinia lacerans*, Roxb.), the

usual form of which differs at first sight in the larger flowers, longer pedicels, and much laxer inflorescence. A specimen, probably of this species, from Madras, in the Kew herbarium, forms a connecting link between the two.

Dr. Schweinfurth (Fl. Æthiop. pp. 5 and 255) indicates a second species as occurring in Abyssinia and Sennaar, differing from *P. abyssinicum* in the smaller pinnæ and the number (20 pairs) of leaflets to each. No name or description is given.

6. GLEDITSCHIA, Linn.; Benth. et Hook. f. Gen. Plant. i. 568.

Flowers polygamous. Calyx-tube turbinate, segments 3–5 linear or oblong, in æstivation open or slightly imbricate. Petals 3–5 sessile, slightly unequal, imbricate. Stamens 6–10, free, unequal; anthers small, uniform, ovate or rotundate, dehiscing longitudinally. Ovary stipitate (or sessile), villous, narrowed into the short style; stigma obtuse; ovules 2–∞. Legume indehiscent or tardily 2-valved; in the African species flat, coriaceous, nearly straight. "Seeds albuminous."—Trees frequently armed with simple or branched spines. Leaves bipinnate or simply and abruptly pinnate. Stipules inconspicuous. Flowers small in simple or paniculate spikes or racemes.

A small genus, occurring in North America and temperate Asia, as well as in Lower Guinea. The following species is endemic.

1. **G. africana,** *Welw.; Benth. in Linn. Trans.* xxv. 304. Tree of moderate size, with a spreading crown; extremities as well as the young leaves and inflorescence softly pubescent-tomentose or villous. Leaves bipinnate, pinnæ opposite, abruptly 3–4-jugate or occasionally 2–3-jugate with a terminal pinna; leaflets in each pinna 8–13, alternate, coriaceous, obliquely elliptical or varying from ovate- to obovate-elliptical, obtuse or retuse, at length often glabrous at least above, and shining with prominent venation, $\frac{3}{4}$–$1\frac{1}{2}$ in. long. Common petiole sometimes with a gland or papilla between the pinnæ; petiolules rarely 1 line. Spikes dense, villous, often interrupted slightly, $1\frac{1}{2}$–3 in. long, collected in a short terminal panicle of $\frac{1}{2}$ ft.; flowers sessile solitary or fascicled in the axil of small lanceolate bracts, mostly 5-merous, 2 lines long. Petals narrow-oblanceolate villous externally especially towards the margin, but slightly exceeding the narrow-oblong calyx-lobes. Stamens 10 or 1 or 2 imperfect, longer than the petals; filaments very thinly pilose. Ovary pilose, stipes below consolidated with the calyx-tube; style glabrous; ovules about 5. Legume flat, straight, oblong, usually very obtuse with a minute subterminal apiculus, narrowed below into a stipes of $\frac{1}{4}$–$\frac{1}{2}$ in.; 3–4 in. long, 1–$1\frac{1}{4}$ in. broad.

Lower Guinea. Huilla and Pungo Andongo, Angola, *Dr. Welwitsch!*

7. POINCIANA, Linn.; Benth. et Hook. f. Gen. Plant. i. 569.

Calyx-tube short turbinate, persistent; segments 5, nearly equal, valvate in æstivation, deciduous. Petals 5, imbricate, nearly equal, with a rounded lamina and distinct claw. Stamens 10, free, declinate; filaments filiform, pubescent or villous at base; anthers uniform, oblong,

dehiscing longitudinally. Ovary sessile or narrowed below, ∞-ovulate; style elongate, filiform; stigma terminal ciliolate, but slightly dilated. Legume 2-valved, compressed, coriaceous, several- or many-seeded. Seeds compressed ellipsoidal or oblong; cotyledons plane, the width of the larger diameter of the seed within a thin layer of albumen, cordate at base embracing the short thick radicle.—Unarmed trees. Leaves bipinnate; leaflets small, numerous. Stipellæ 0. Flowers handsome, orange or scarlet, corymbose at the ends of the branches.

A small genus, confined to India, Madagascar, and Nile land.

1. **P. elata,** *Linn.; DC. Prod.* ii. 484. Branches glabrous or the herbaceous extremities puberulous. Pinnæ usually in 4–6 pairs; leaflets 10–14-jugate, oblong or oblanceolate-oblong, obtuse or retuse, glabrous or on first expansion silky-pubescent, veinless, subsessile, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Flowers large in terminal corymbs or from the upper axils, pedicels short, with the calyx puberulous or minutely silky, $\frac{1}{2}$–$1\frac{1}{2}$ in. long; bracts lanceolate or ovate-oblong, very early caducous. Calyx-lobes coriaceous oblong or oblanceolate, pointed or obtuse, deciduous. Petals rather longer than the calyx, with a broadly obovate or rotundate-cuneate crisped lamina narrowed into a distinct claw. Filaments much exceeding the petals, 2–4 in. long, pilose below. Style elongate, filiform. Young fruit in our specimens 4–7 in. long, $\frac{3}{4}$–1 in. broad, linear-oblong or narrowly oblanceolate below to the persistent calyx-tube, straight or sinuous, narrowed above to the persistent style-base. Seeds much compressed elliptic-oblong, smooth. *Cæsalpinia elata,* Sw. Obs. 166.

Nile Land. Abyssinia, *Roth!* Nubia (*Schweinf. et Asch. Enum.*).

An infusion of the seeds, Dr. Roth states, is used as a purgative. The same plant extends eastward through Arabia into India.

The showy and nearly allied *P. regia,* Boj. (Bot. Mag. 2884), a native of Madagascar, is frequently planted in towns and villages on the eastern coast and in Angola. The leaves are 1–2 feet long, with 8–20 pairs of multifoliolate pinnæ. Petals 2–3 times longer than the calyx-lobes with an orbicular lamina and long claw. Stamens relatively shorter than in *P. elata,* shorter than or nearly equalling the petals. Legume about 4 in. long according to the original description, 6–8 in. Dr. Kirk, while specimens in the Kew Museum are about 2 ft. in length.

8. **PARKINSONIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 570.

Calyx divided nearly to the base into 5 subequal membranous slightly imbricate segments. Petals 5, spreading. Stamens 10, free, scarcely declinate; filaments pilose at base; anthers uniform, elliptical, dehiscing longitudinally. Ovary narrowed to the base, 8–15-ovulate; style subfiliform, recurved in bud; stigma terminal, minute. Legume narrow-linear narrowed to each end, usually constricted between the subdistant longitudinally-disposed seeds, thinly coriaceous, longitudinally reticulate-striate, scarcely or not at all dehiscent. Seeds 1–6 or 8 oblong or subcylindrical, albuminous.—Shrub or small tree. Leaves 2-pinnate; pinnæ 2–4, with the rachis much elongate, flattened, bearing numerous small oblong or linear opposite or scattered leaflets which are occasionally abortive; common petiole very short or obsolete, spine-

pointed, the pinnæ appearing as very long simply pinnate geminate or fascicled leaves at first sight. Flowers in lax axillary racemes, yellow; bracts early caducous.

A genus of three species, one Cape and two American.

1.* **P. aculeata,** *Linn.*; *DC. Prod.* ii. 486. Coriaceous flattened rachis of the pinnæ $\frac{1}{2}$–2 ft. long; leaflets frequently obsolete or minute, seldom more than $\frac{1}{4}$–$\frac{1}{2}$ in. long. Racemes shorter than the leaves. Flowers $\frac{1}{2}$–1 in. in expansion.

Not indigenous in Africa, though cultivated or naturalized in various localities.

9. **OLIGOSTEMON,** Benth. et Hook. f. Gen. Plant. i. 570.

Sepals 4 distinct, the outer anterior coriaceous, sheathing the posterior and larger in bud; inner sepal deeply 2-lobed, subpetaloid. Petals 5, much shorter than the outer sepals, 3 upper lanceolate-oblong colour-veined, 2 lower smaller glandular-denticulate. Stamens 4, decurved; filaments very short and flattened; anthers large, affixed immediately above the base, 2-celled, each cell deeply sulcate and terminating in an acuminate tip, dehiscing longitudinally near the apex, 2 posterior anthers connate nearly throughout. Ovary narrowed below, with 4 strong longitudinal ridges or wings, 2-ovulate; style subfiliform; stigma small terminal. Legume elongate, narrowed below, acuminate, not seen mature.—Shrub or small tree. Leaves alternate imparipinnate; leaflets petiolulate 5–9, rather large. Racemes erect, terminal, with numerous Alpinia-like flowers.—*Duparquetia*, Baill. in Adansonia, vi. 189.

Peculiar to West Tropical Africa.

M. Baillon, taking a different view of the structure of the flower, describes the calyx as diphyllous, consisting only of the outer posterior sepal and the opposed anterior contiguous one embraced by it; the 2 inner lobed sepals with the 3 posterior petals make up the corolla, while the anterior glandular reduced petals are described as petaloid staminodia. Fertile stamens he describes as 8 in number, regarding each of the four 2-celled anthers as double.

1. **O. pictus,** *Benth. in Trans. Linn. Soc.* xxv. 305. t. 39. A shrub of 6–20 ft.; extremities and inflorescence at first rusty-puberulous. Leaflets usually 7–9, thinly coriaceous, obovate-elliptical or the lower broadly elliptical, rounded and shortly apiculate above, cuneate, or slightly rounded at the base, lateral nerves few, subremote, connected by somewhat transverse reticulation, 4–6 in. long, $2\frac{1}{2}$–3 in. broad, on petiolules of $\frac{1}{4}$–$\frac{1}{3}$ in. Racemes erect densely many-flowered, at length $\frac{1}{2}$–1 ft. long. Bracts minute, ovate-deltoid, deciduous. Pedicels ascending or patent, puberulous $\frac{1}{2}$–1 in. long, articulated a little above the base with a pair of minute bracteoles below the joint. Inner larger sepal 1–$1\frac{1}{4}$ in. long. Anthers $\frac{1}{2}$ in. long. Mature legumes not seen; the most advanced in the Kew herbarium are 5 in. long, and nearly $\frac{1}{2}$ in. broad above.—*Duparquetia orchidacea*, Baill. in Adans. vi. 190. t. 4.

Upper Guinea. Cameroons river, *Mann!* Gaboon, *Duparquet, Griffon du Bellay.*

Not known from elsewhere.

10. **CASSIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 571.

Calyx-tube very short, segments 5, imbricate in æstivation. Petals 5, subequal or the anterior larger, imbricate. Stamens 10, all perfect and subequal or 3 or 5 wanting or imperfect; anthers uniform or 2 or 3 anterior larger, 2-celled, dehiscing by terminal pores or longitudinally more or less from the apex. Ovary sessile or stipitate, frequently arcuate; style short or long; stigma terminal; ovules several or numerous. Legume terete or flattened, indehiscent or 2-valved, with or without transverse internal septa; rarely winged or appendaged. Seeds albuminous flattened at right angles to or parallel with the valves, rarely rhomboid-subterete, transverse or rarely longitudinally disposed in the legume. Cotyledons plane or sinuous.—Trees, shrubs, or herbs. Leaves abruptly pinnate; common petiole frequently with sessile or stipitate glands, either solitary near the base or interpetiolular. Stipules various. Flowers yellow or red, in axillary or terminal racemes, corymbs or fascicles; occasionally solitary or geminate in the axils.

A very large genus of warm and tropical countries, both of the New and Old World, especially abundant in the former. Of the following species, 13 are endemic, and 4 or 5 appear to be introduced or commonly cultivated or perhaps naturalized.

A. Sepals obtuse. Perfect stamens usually 7, of which 2–3 anterior are much larger, with elliptical or ovate anthers not exceeding 2–3 lines, dehiscing longitudinally. Legumes elongate, terete, or slightly compressed, indehiscent or rarely dehiscent, divided by transverse partitions into numerous 1-seeded cavities; seeds horizontal, flattened at right angles to the axis of the legume. (§ *Fistula,* DC.)

Bracts usually present at time of flowering.

Racemes 4–15 in.; pedicels 1¼–2 in. Leaflets glabrous, obtuse, or broadly-pointed	1. *C. Sieberiana.*
Racemes short or subcorymbose; bracts deflexed; pedicels 2½–3 in. Leaflets glabrous, obtusely acuminate. (Longer filaments distinctly dilated)	2. *C. Arereh.*
Racemes short or corymbose; bracts hairy, crowded. Leaflets pubescent at least beneath, obtuse	3. *C. abbreviata.*

Bracts 0 or deciduous before flowering.

Extremities, inflorescence, and young leaves pubescent. Racemes ½–2 ft. Leaflets obtuse	4. *C. Kotschyana.*
Glabrous. Racemes 3–6 in. Leaflets acute	5. *C. Mannii.*

B. Sepals obtuse. Perfect stamens usually 7, of which 2 or 3 anterior are longer, with curved linear anthers 3–6 lines long. Staminodia usually 3, posterior. (§ *Senna,* Benth.)

Flowers in corymbs collected at the extremities. Outer sepals much smaller. Three anterior stamens longer. Seeds horizontal, flattened at right angles to the valves.

Leaflets 6–9 pairs, acute or acuminate. Interpetiolular glands sessile. Stipules ½-cordiform. Bracts from cordate-apiculate to ovate-cymbiform	6. *C. Petersiana.*
Leaflets 7–9 (–12) pairs, very obtuse. Interpetiolular glands ovoid or oblong. Stipules subulate. Bracts caducous	7. *C. goratensis.*
Leaflets 7–12 pairs, obtuse. Interpetiolular glands slender stipitate 2–3 lines. Stipules and bracts caducous	8. *C. Tettensis.*

Flowers in axillary fascicles racemes or corymbs shorter than the leaves, or confluent above and terminal. Sepals nearly equal. Two anterior stamens longer. Legumes terete or flattened, unappendaged, 6–15 times longer than broad. Seeds variously flattened.
Seeds transverse (across the pod).
Leaflets 4–5 pairs. Petiole with obtuse gland near base.
Legumes flattened. (Annual.) . . . . . 9. *C. occidentalis.*
Leaflets 5–9 pairs. Petiole with small gland near base.
Legume turgid or subterete. (Shrubby.) . . . . . 10.* *C. Sophera.*
Leaflets 3–4 pairs. Petiole with oblong glands between the leaflets. Legume terete. (Shrubby.) . . . . 11.* *C. lævigata.*
Seeds longitudinal (lengthwise in the pod). Leaflets 2–3 pairs. Legume 4–8 in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad. (§ *Prososperma*, Vog.) . . . . . 12. *C. Tora.*
Flowers in axillary (or subterminal), many-flowered, often elongate racemes. Sepals nearly equal. Two anterior stamens larger. Legumes flattened.
Legume with a broad longitudinal wing on each valve.
Leaves 1–3 ft.; leaflets 9–12 pairs, 3–7 in. long . . . 13.* *C. alata.*
Legume not winged.
Stipules ovate-lanceolate, deciduous. Leaflets 4–5 pairs, 4–6 in. long. Legume 6 times longer than broad, straight . . . . . 14. *C. podocarpa.*
Stipules ovate-rotundate, reflexed. Leaflets 8–14 pairs, 1–2 in. long. Legume 3–6 times longer than broad, straight or sinuous . . . . . 15. *C. didymobotrya.*
Stipules linear-falcate. Leaflets 4–6 pairs. Legume straight, 6–8 times longer than broad . . . . . *C. glauca*, p. 277.
Stipules lanceolate or subulate. Legume 2–4 times longer than broad, falcate or subreniform.
Valves of legume with a row of crest-like plaits.
Leaflets obtuse . . . . . 16. *C. obovata.*
Valves of legume unappendaged.
Leaflets 5–8 pairs, obtuse, pubescent. Legume 1–1$\frac{1}{4}$ in. long . . . . . 17. *C. holosericea.*
Leaflets 4–5 pairs, acute, puberulous, or glabrate.
Legume $\frac{3}{4}$–1 in. broad . . . . . 18. *C. acutifolia.*
Leaflets 5–8 pairs, acute, glabrous. Legume 7–8 lines broad . . . . . 19. *C. angustifolia.*

C. Sepals rather obtuse, subequal. Stamens usually 4–6, all perfect. Leaflets in 2 pairs. Flowers small, in lax short terminal or leaf-opposed racemes. Legume flat, 1–2 in. (§ *Absus*, Vog.) . . . . . 20. *C. Absus.*

D. Sepals, or at least the outer ones, acute. Stamens 10 or fewer, all perfect, similar and but slightly unequal (rarely 2–3 abortive); anthers linear. Legume 2-valved, flat, linear. Seeds compressed, the flat sides parallel with the valves. Pedicels solitary, in pairs or fascicles, axillary or supra-axillary. Leaflets in 4–80 pairs. (§ *Chamæcrista*, DC.)
Leaflets, 4–7 pairs. Petiole with 1–3 stipitate glands, diffuse, wiry . . . . . 21. *C. Grantii.*
Leaflets 8–80 pairs.
Petiole with stipitate gland at base. Flowers small, sepals 3 lines. Pedicels $\frac{1}{2}$ in. Leaflets 8–18 pairs . 22. *C. zambesica.*
Petiole with sessile gland at base. Flowers small, sepals 2–3 lines. Pedicels 1–2 lines. Leaflets 8–18 pairs . 23. *C. nigricans.*
Petiole with sessile gland at base. Sepals 3–5 lines. Pedicels $\frac{1}{3}$–4 in. Leaflets 10–80 pairs, usually 1–3 lines long . . . . . 24. *C. mimosoides.*

Petiole with gland usually sessile at base. Sepals 4–6 lines. Pedicels often supra-axillary, ¼–½ in. Leaflets 30–50 pairs, ½ in. long	25. *C. Kirkii.*
Petiole with or without sessile glands. Leaflets 8–11 pairs, lower ¼ in., upper much smaller, strongly-nerved, falcate. Stipules narrow, obliquely ovate-lanceolate	26. *C. falcinella.*

1. **C. Sieberiana,** *DC. Prod.* ii. 489. A small tree, glabrous or the extremities and rachis of the leaves and inflorescence puberulous. Leaflets in 6–14 pairs, varying with fewer and probably more, ovate-elliptical oblong or occasionally ovate-rotundate, obtuse entire or emarginate or broadly pointed and acute, base rounded or broadly cuneate, venulose-reticulate and shining above, paler and sometimes thinly puberulous beneath, at least on the midrib, 1¼–3½ in. long, 1–2 in. broad; petiolule 2 lines; common petiole without glands, finely pubescent or nearly glabrous, 5–12 in. long in our specimens. Racemes from 4 or 5–18 in. long. Bracts usually present during flowering, linear or linear-lanceolate, from ⅓–⅔ in. long; bracteoles subulate, much shorter. Pedicels patent or the lower deflexed, 1¼ in. to nearly 2 in. long. Sepals obtuse, 3–4 lines long. Petals broadly elliptical or ovate-elliptical, obtuse, unguiculate, ¾–1 in. long. Filaments of three longer stamens exceeding the petals, filiform or slightly thicker above than at the base; the other stamens shorter than the petals. Ovary puberulous or pubescent. Legume elongate, subterete, with scarcely prominent sutures.—Guill. et Perr. Fl. Seneg. i. 259. *Cathartocarpus conspicuus*, Don, Gen. Syst. ii. 453 fide Fl. Nigrit. 324.

Upper Guinea. Senegambia, *Sieber! Heudelot!* Cayor, and on the Gambia (*Guill. et Perr.*). Sierra Leone, *Don!* Bagroo river (leaflets broadly pointed), *Mann!* (? A form with caducous bracts, Niger, *Barter!*)

Dr. Schweinfurth and Ascherson cite this species as occurring in Kordofan in their enumeration of Nile land plants.

Very nearly allied to this species is *C. Fistula*, very common in gardens in all tropical countries, and occasionally sent home by collectors from settlements in Tropical Africa. So far as our material enables us to judge, it differs chiefly from *C. Sieberiana* in its minute bracts, which are caducous long before expansion of the flowers, so that the inflorescence is usually described as ebracteate. The leaflets of *C. Fistula* are usually larger, varying to 4–6 in. in length; and the cylindrical smooth indehiscent legumes sometimes reach 3 ft. in length. The plant from the Niger cited above may be a small-leaved form of *C. Fistula*. The Bagroo form resembles, as to leaves, *C. nodosa*, Ham., the thickly dilated filaments of the 3 longer stamens and the shorter lateral racemes distinguish this species however. *Cassia psilocarpa*, Welw. Apont. Phyto-geogr. No. 40, may be *C. Sieberiana*.

2. **C. Arereh,** *Delile, Voy. à Méroé*, 29. Shrub or small tree, glabrous in all its parts or the sepals and upper extremity of the pedicels faintly puberulous. Leaflets usually in 7–9 pairs, ovate to ovate-lanceolate, obtusely acuminate or more rarely broadly and obtusely pointed, base more or less cuneately narrowed into a petiolule or rounded, reticulate-venose, with prominent midrib beneath, 2–2½ in. long, 10–16 lines broad; petiolules 2–3 lines long; common petiole without glands, ¾–1 ft. long. Racemes terminal, short or subcorymbose, the long slender spreading pedicels of 2½–3 in. rather crowded from the axils

of deflexed or spreading linear-setaceous or subulate bracts of $\frac{1}{2}$–$\frac{3}{4}$ in. Sepals obtuse, glabrous or nearly so, 4–7 lines long. Petals narrowed to the base, 1 in. or slightly longer. Three longer stamens exceeding the petals, their filaments distinctly dilated near the middle. Ovary adpressed-puberulous. Legume 12–20 in. long, about 1 in. diameter, hard and woody, terete, smooth, glabrous, at length tardily longitudinally dehiscent.—Rich. Fl. Abyss. i. 249, t. 47; Ferret et Galinier, Abyss. Atlas, Bot. t. 3. *Cathartocarpus Atteleh*, Don, Gen. Syst. ii. 453. *C. Fistula*, in Sched. Herb. Schimp. Abyss. No. 896.

Nile Land. Abyssinia, *Schimper!* Sennaar, *Cienkowsky!* Nubia and Kordofan (*Schweinf. et Asch. Enum.*).

3. **C. abbreviata,** *Oliv.* Shrub or tree, attaining 15–25 ft., extremities leaves on expansion and inflorescence shortly pubescent. Leaves 1 ft. or shorter; leaflets in 8–12 pairs, elliptical or oblong-elliptical, obtuse, rounded or broadly cuneate at base, pubescent or subvillous at least beneath at first, at length sometimes nearly glabrous, venation reticulate; $1\frac{1}{4}$–$1\frac{1}{2}$ in. long; petiolules 1 line; common petiole eglandular. Racemes terminal and from lateral shoots towards the ends of the branches, rather short and subcorymbose, the pubescent rachis 2–6 in. long, nearly concealed by the recurved bracts and bracteoles. Bracts linear, acute, hairy, $\frac{1}{4}$–$\frac{1}{3}$ in. long. Pedicels ascending, straight, pubescent, 2–$3\frac{1}{2}$ in. long. Sepals elliptical or ovate obtuse pubescent, $\frac{1}{3}$ in. long. Petals obovate-oblong, $\frac{3}{4}$–1 in. long, narrowed at the base. Longer stamens exceeding the petals; filaments subfiliform or but slightly dilated near the middle. Ovary shortly and densely villous with ascending or adpressed tawny hairs. Legume 12–15 in. long, subterete, slightly curved, with moderately prominent sutures, clothed throughout with a short dense tawny velvety tomentum.

Mozamb. Distr. Near Lupata and Tette, Zambesi, *Dr. Kirk!* Manganya Hills (flowers bright ochre-coloured), *Dr. Meller!* West shore of Lake Nyassa, *Dr. Kirk!*

Dr. Kirk describes the pods as "long, dry, divided by transverse septa."

4. **C. Kotschyana,** *Oliv.* A small tree, the extremities, common petioles, unfolding leaves and inflorescence shortly yellow or tawny-pubescent or puberulous; leaflets approximated in 4–10 pairs, from broadly ovate-elliptical to elliptic-oblong, apex rounded or obtusely pointed, base very broadly cuneate or subtruncate, minutely adpressed-pubescent beneath, glabrate, and at length shining and reticulate-venose above, the lateral nervures prominent and looping; $1\frac{1}{2}$–2 in. long, 10–14 lines broad; petiolules 1–2 lines; common petiole 3–9 in. eglandular. Racemes rather lax, from 5 or 6 in. to nearly 2 ft. long; bracts deciduous before expansion of the flowers. Pedicels spreading about $1\frac{1}{2}$ in. long. Sepals obtuse, ovate- or oblong-elliptical, closely puberulous, $\frac{1}{3}$ in. long. Petals $\frac{3}{4}$ in. long, shortly clawed. Three longer stamens much exceeding the petals, filaments subfiliform not distinctly dilated, their anthers thinly pubescent behind. Ovary pubescent. Legume unknown.

North Central. Musgu, *E. Vogel!*
Nile Land. Sennaar, *Kotschy!*

5. **C. Mannii,** *Oliv.* A glabrous tree attaining 60 ft.; branches terete, smooth. Leaves 9–15 in. long; leaflets approximated in 1–9 pairs or scattered, elliptical or ovate-oblong, finely or sometimes broadly acute, more or less rounded at the base, glabrous, reticulate above, midrib prominent beneath, $1\frac{1}{2}$–3 in. long, 1–$1\frac{1}{2}$ in. broad; petiolules 2 lines. Racemes short, terminal and lateral, $2\frac{1}{2}$–6 in. long, ebracteate. Pedicels spreading, angular or sulcate, $1\frac{1}{2}$–2 in. long more or less. Sepals membranous, elliptical or ovate-elliptical obtuse, veiny, 4–5 lines long. Petals about $\frac{3}{4}$ in. long, lamina ovate or ovate-elliptical obtuse, strongly veined, with a narrow distinct claw. Longer stamens exceeding the petals, filaments filiform not dilated. Ovary glabrous. Legume not seen.

Upper Guinea. Princes Island, *Mann!*

Dr. Welwitsch collected in the province of Cazengo, Angola, a *Cassia* very nearly allied to *C. Mannii*, but differing in having obtuse and emarginate leaflets. It may prove a distinct species, but the specimens hardly enable me to decide.

6. **C. Petersiana.** *C. Bolle in Peters' Mossamb. Bot.* 13. Shrub; extremities rachis of the leaves and peduncles thinly pubescent puberulous or glabrate. Leaves 5–10 in. long; leaflets usually 6–9-jugate, broadly lanceolate ovate or oblong-lanceolate, acute or acuminate, rounded at the base, glabrous and reticulate above, paler with sparse adpressed short hairs or glabrescent beneath, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, $\frac{1}{2}$–1 in. broad, shortly petiolulate; common petiole thinly pubescent or nearly glabrous, with a linear or subconical gland between the leaflets, which would seem to be occasionally either deciduous or obsolete. Stipules half-cordiform or -reniform, sessile, $\frac{1}{2}$–$\frac{3}{4}$ in. long, deciduous or partially persisting. Flowers in simple or branched corymbs or short racemes, terminal and from the upper axils, forming irregular leafy or much bracteate panicles at the ends of the branches. Bracts pubescent, the lower broadly rotundate, subcordate, apiculate, the upper ovate, cymbiform, with thickened gland-like curved bracteoles; the principal branches of the inflorescence subtended by rudimentary or obsolete leaves, the broad stipules of which are often fully developed. Pedicels $\frac{1}{2}$–$1\frac{1}{2}$ in., pubescent or puberulous. Sepals very unequal, the two outer much smaller, thinly pubescent, three inner subpetaloid. Petals clawed, the posterior smaller; anterior exceeding the stamens. Three anterior anthers much larger, linear, curved, 3–4 lines long; four intermediate dehiscing by terminal pores, three posterior abortive, cordate or ovate. Ovary silky-pubescent. Legume not seen.

Nile Land. Abyssinia (a robust pubescent form, the longer clawed elliptic-obovate petals exceeding 1 in.), *Schimper!*

Mozamb. Distr. Quirimba and Mozambique, *Dr. Peters!* Near Senna, *Dr. Kirk!* Lower Shire Valley, *Dr. Meller!*

C. Delagoensis, Harv. (Fl. Capensis, ii. 272), found at Natal and Delagoa Bay, is a near ally of this species, differing, apparently, in its much smaller, narrower, and more numerous leaflets, with obscure venation.

We have a single specimen in flower only from Zambesi (Dr. Kirk), apparently very nearly allied to *C. Petersiana*, having the same stipules, but the bracts are caducous long before expansion of the flowers, and the leaflets thinly pubescent above are dis-

tinctly though minutely sericeous beneath. The corymbose tawny-pubescent racemes are collected into a large terminal almost leafless panicle.

7. **C. goratensis,** *Fresen. in Flora*, 1839, 53. A shrub or small compact tree; extremities, leaves especially underneath, and peduncles pubescent. Leaves 5–7 in. long, rachis pubescent channelled above, usually with interpetiolular ovoid or oblong glands; leaflets in 7–9 (–12) pairs, oblong-elliptical or varying from ovate to obovate-elliptical, apex very obtuse, entire or emarginate minutely mucronulate, rounded at the base, pubescent or at length subglabrate above, paler and appressed-pubescent beneath, 1–1½ (–1¾) in. long; petiolule about 1 line. Stipules subulate, usually early deciduous. Corymbs few- or several-flowered, short, crowded at or near the ends of the branches. Bracts very early caducous, usually fallen before expansion of the outer flowers; bracteoles glanduliform. Sepals very unequal, two outer much smaller, pubescent. Petals unequal, distinctly clawed. Three anterior stamens shorter than the larger petal, anthers curved, 4–6 lines long; intermediate anthers nearly straight with an obtuse sharply curved tip. Legumes slightly compressed or subterete, usually constricted, at least when dry, between the numerous uniseriate closely-packed seeds; ¼–⅓ in. in diameter, varying to 4 in. in length. Cotyledons more or less plicate within a thin layer of albumen.

North Central. Musgu, *E. Vogel!*

Nile Land. Abyssinia, *Schimper! Dillon!* and others. Sennaar, *Kotschy!* Bahr-el-Abiad (*Schweinf. et Asch.*).

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi land, *Dr. Meller! Dr. Peters.*

I think this is probably *Cassia Singueana*, Delile (Voy. à Méroé, 28), but the description given is very imperfect, neither flower nor fruit being referred to. As the plant is universally known under Fresenius' name it is hardly desirable to supersede it. *Cassia Sabak*, of the same botanist, described without leaves or fruit, I cannot identify. It belongs, however, to the group of large-flowered Cassias, with the 3 anterior stamens larger. The racemes are described as short and tomentose; petals 1½ in. long.

8. **C. Tettensis,** *C. Bolle in Peters' Mossamb. Bot.* 14 (*ex descr.*). Shrub; extremities leaves underneath and inflorescence very shortly and rather thinly pubescent. Leaves ½ ft. more or less; common petiole pubescent, channelled, with slender stipitate interpetiolular glands often 2–3 lines in length; leaflets 7–12-jugate oval-oblong or varying to oblanceolate-oblong, obtuse with a distinct slender mucro, thinly pubescent or at length glabrate above, appressed sparsely silky-pubescent beneath, 1–1½ in. long, ⅓–½ in. broad; petiolules about ½ line. Stipules caducous. Corymbs panicled at the extremities; bracts small, cymbiform, caducous; bracteoles glandular, stipitate. Two outer sepals much smaller than the inner, thinly silky below. Anterior petals larger, lamina ¾–1 in. long, with a wavy margin, claw distinct, 2 lines long. Stamens as in *C. Petersiana*, the three anterior much larger, with strongly curved anthers, considerably shorter than the corresponding petals. Ovary appressed-

silky. Immature legume "cylindrical, slightly compressed, obtuse, pubescent."

Mozamb. Distr. Lupata, Zambesi, *Dr. Kirk!* Tette and Senna, *Dr. Peters.*

9. **C. occidentalis,** *Linn.*; *DC. Prod.* ii. 497. Stem firmly herbaceous or woody below, annual or of 2–3 years' duration (*Dr. Welwitsch*), erect, often forming dense bushy masses, a few feet in height, glabrous or nearly so. Leaflets membranous, in 4–5 pairs, ovate- or elliptic-lanceolate, usually acute or acuminate, glabrous minutely ciliolate or obsoletely pubescent beneath, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, the upper varying to 3–4 in.; common petiole without interpetiolular glands, but with a short obtuse gland near the base, black when dry. Stipules lanceolate or ovate-lanceolate, membranous, deciduous. Flowers in short few-flowered axillary racemes or fascicles, the peduncle and pedicels seldom exceeding 1 in., or towards the ends of the branches the fascicles confluent forming an interrupted terminal raceme; the leaves reduced or bract-like. Bracts thin, linear-lanceolate or oblong acuminate, deciduous. Sepals obtuse, glabrous or nearly so, the outer rather shorter. Petals obtuse, venose. Two anterior stamens larger, with slightly curved anthers $\frac{1}{4}$ in. long, shortly and broadly produced at the apex. Legume 2-valved, linear compressed, slightly falcate or straight, apiculate, rather coriaceous, margined with straight sutures; $3\frac{1}{2}$–5 in. long, 3–4 lines broad; the pericarp when dry usually depressed between the seeds, which are usually but not always flattened in the same plane as the pod. Cotyledons plane or nearly so, in the larger diameter of the seeds, enclosed between thick layers of albumen.—*C. planisiliqua,* Linn. ex. Bot. Reg. t. 83.

Growing in damp and watery places. Widely diffused in Tropical Africa, as indeed throughout the Tropics generally, both of the Old and New World. Dr. E. Vogel describes it as forming dense islets in the Yeau river in North Central Africa.

Cassia contorta, Vog., cited as a synonym in "Flora Nigrit." 324, proves to be *C. Tora,* L.

10.* **C. Sophera,** *Linn. Sp. Pl.* 542; *Benth. Fl. Austr.* ii. 283. Erect, shrubby, glabrous or nearly so, attaining 3–5 ft. in height. Leaves inflorescence and flowers similar to those of *C. occidentalis;* the leaflets usually more numerous, varying from 5–9 pairs, often obliquely lanceolate and finely acuminate. Petiole with a small basal gland. Legume 2-valved, thinly coriaceous or chartaceous, turgid or subterete, from $2\frac{1}{2}$–5 in. long, 3–5 lines in diameter. Seeds very numerous and closely packed. Embryo as in *C. occidentalis.*—For synonymy see Fl. Australiensis, l.c.

Upper Guinea. Fernando Po, in cultivated ground, and Cape Coast, *T. Vogel!* Fernando Po, *Mann!*

An Indian plant, extending to Australia. Mr. Bentham (l. c.) speaks of this species as common in Tropical Africa, but I have only seen it from the localities cited, and there it would appear to be doubtfully indigenous.

C. tomentosa, L. f. A yellow- or tawny-tomentose shrub, with oblong-oval leaflets $\frac{3}{4}$–$1\frac{1}{4}$ in. long in 6–8 pairs, and short few-flowered corymbs from the upper axils, forming collectively a lax leafy panicle, occurs at the Cape, and is widely diffused through the

Tropics both in Asia and America, though probably only truly native in the latter. It is likely to turn up in Tropical Africa as an introduced or perhaps naturalized species.

11.* **C. lævigata,** *Willd.; Walp. Rep.* i. 816. A glabrous shrub, with terete green erect branches, attaining 6–10 ft.; leaflets in 3–4 pairs, membranous, the upper larger, varying from ovate-oblong to lanceolate, finely acuminate, the larger from $2\frac{1}{2}$–4 in. in length; petiolules 1 line; common petiole 4–5 in., channelled, glabrous, with oblong or cylindrical interpetiolular glands; basal gland 0. Stipules linear deciduous. Flowers glabrous, similar to those of *C. occidentalis*, in pedunculate axillary corymbose erect racemes, much shorter than the leaves. Bracts caducous. Legumes erect, thinly coriaceous or chartaceous, terete, smooth, glabrous, obtuse, apiculate, 3–$3\frac{1}{2}$ in. long, about $\frac{1}{2}$ in. in diameter, tardily dehiscent in 2 valves. Seeds horizontal, shining. Embryo as in *C. occidentalis*.—Collad. Hist. Cass. t. 5.

Upper Guinea. Sierra Leone, *T. Vogel!* Fernando Po, *T. Vogel! Mann!*

A Tropical American species, probably not indigenous in Africa. It is recorded from Australia, but doubtfully native there according to Mr. Bentham.

12. **C. Tora,** *Linn.; Walp. Rep.* i. 817. Stem annual, erect or ascending, terete or nearly so, glabrous or thinly pilose or pubescent, attaining 2–3 ft. Leaflets in 2 or 3 pairs, obovate or obovate-oblong, obtuse, mucronate, thinly subappressed-pilose or glabrous, varying from $\frac{3}{4}$–$1\frac{1}{2}$ or 2 in. in length; petiolules very short. Common petiole pubescent or nearly glabrous, with conspicuous narrow-cylindrical glands between at least the lower pinnæ. Stipules subulate, or narrow-linear. Flowers usually in pairs or solitary, axillary, with or without a short common peduncle; pedicels $\frac{3}{4}$–1 in. long, in fruit stout ascending. Sepals unequal, obtuse. Petals obovate, shortly clawed. Anterior anthers enlarged and usually distinctly obtusely produced at the apex. Legumes elongate, curved, narrow-linear, 4–8 in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad, oblong-quadrate in section; valves separating, marked internally with the oblique transverse partial septa. Seeds arranged lengthwise, their larger diameter parallel with the valves, rhomboidal or obliquely oblong; cotyledons plicate in transverse section.—*C. obtusifolia*, Linn., Walp. Rep. l.c. *Chamæfistula contorta*, Don, Gen. Syst. ii. 452. *Cassia contorta*, Vog., Walp. Rep. i. 816.

Widely diffused in Tropical Africa, as indeed through the Tropics generally. According to T. Vogel the stem occasionally becomes arborescent in Guinea.

13. ***C. alata,** *Linn.; DC. Prod.* ii. 492. An erect glabrous or subglabrous shrub of 3–8 ft.; stem terete, smooth, glabrous, or minutely puberulous. Leaves from 1–2 or 3 ft. in length, rachis acutely margined above when dry, glandular with a prominent transverse ridge connecting the opposite leaflets; leaflets in 9–12 pairs, very broadly oblong elliptic-oblong or the upper larger leaflets obovate-elliptical, rounded above and very obtuse or retuse, mucronate, base oblique truncate or subcordate at least as to the lower margin, glabrous, firmly membranous; the larger leaflets varying from 3–7 in. in length, subsessile or petiolules 1 line. Stipules obliquely triangular, acute, broad-based, persis-

tent. Flowers in long erect axillary or apparently terminal stoutly pedunculate racemes. Bracts coloured, ovate or elliptical, obtuse or broadly pointed, imbricating at first, early deciduous, $\frac{1}{2}$–1 in. long. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. Sepals coloured membranous, nearly equal in length. Two anterior stamens with enlarged strongly curved anthers about 5 lines long. Legume 2-valved, thinly but firmly coriaceous, linear apiculate, 5–6 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, each valve with a very prominent crenate longitudinal wing extending the entire length of the valve and incurved towards the ventral suture. Seeds rhomboid-cuneate, compressed; cotyledons sigmoid, in transverse section occupying the median third or half of the seed.

Upper Guinea. Sierra Leone, *Barter!* Abbeokuta, *Barter!* Gaboon river, *Mann!*

Widely spread in the Tropics of both hemispheres, though probably only indigenous in America.

14. **C. podocarpa,** *Guill. et Perr. Fl. Seneg.* i. 259 (*ex descr.*) A glabrous shrub or small tree of 15 ft.; branches terete, smooth. Leaves ample 9–14 in. long; leaflets membranous in 4 or 5 pairs, elliptical obtuse mucronulate; the upper larger leaflets 4–6 in. long, 2–2$\frac{3}{4}$ in. broad; petiolules 1–2 lines. Common petiole eglandular. Stipules ovate-lanceolate, $\frac{1}{4}$ in. long, more or less deciduous. Racemes dense, at first strobiliform, solitary from the upper axils on long erect naked peduncles, at length equalling or exceeding the leaves. Bracts imbricate, ovate, obtuse, deciduous. Pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. Sepals subequal, obtuse, glabrous. Petals obovate or oblanceolate, obtuse, venose, clawed. Two of the anterior stamens with enlarged curved anthers 4–5 lines long. Legumes spreading or the fruit-pedicels recurved, straight or nearly so, broadly linear, flat, thinly coriaceous or firmly papery, shining, 2-valved, the thin pericarp depressed between the (15–20) seeds when dry, 3$\frac{1}{2}$–4$\frac{1}{2}$ in. long, 6–7 lines broad, tipped with the curved slender remains of the style. Fully developed seeds not seen.—*C. Afzeliana*, Vogel in Linnæa, xv. 70.

Upper Guinea. Sierra Leone, *Afzelius!* Fernando Po, *Mann!* Lagos, *Barter!*

Nearly allied to *C. strobilacea*, H. B. K., of Tropical America. *C. strobilacea*, however, has 10–12-jugate broadly and strictly oblong leaflets, pubescent at least underneath. Dr. Vogel described this species with hairy leaves. Our specimens are glabrous, and the type in the British Museum appeared to me the same on a cursory inspection.

15. **C. didymobotrya,** *Fresen. in Flora*, 1839, 53 (*ex descr.*) A shrub or small tree of 7–10 ft.; branches and leaves at first puberulous or finely pubescent. Leaves 6–12 (–16) in. long; rachis pubescent, plane or slightly convex above, sometimes faintly sulcate when dry; eglandular or with a rudimentary gland between some of the leaflets; leaflets in 8–16 pairs, oval-oblong or oblanceolate-oblong, apex rounded with a conspicuous slender mucro, obliquely rounded at the base, finely pubescent or nearly glabrous at length, 1–2 or 2$\frac{1}{2}$ in. long, 5–9 lines broad; subsessile or petiolules $\frac{1}{2}$ line. Stipules ovate-rotundate, apiculate, reflexed, deciduous, less than $\frac{1}{2}$ in. long. Racemes simple, erect, $\frac{1}{2}$–1 ft.

long, from the axils of the uppermost leaves, solitary or from 2 or 3 to 6 or 8 collected about the ends of the branches, equalling or overtopping the leaves. Pedicels $\frac{1}{6}$–$\frac{1}{4}$ in. Flowers at first closely packed with elliptical or ovate imbricating caducous bracts $\frac{1}{2}$ in. long more or less. Sepals nearly equal in length, the posterior broader, obtuse. Petals obtuse, strongly veined, very shortly clawed. Two of the anterior anthers much enlarged, curved, 5–6 lines long. Legume 2-valved, flat, linear-oblong, slightly sinuous in our specimens, narrowed below into a stipes of $\frac{1}{4}$–$\frac{1}{2}$ in., and above to the persistent base of the style; 3–4 in. long, $\frac{3}{4}$ in. broad. Valves thinly coriaceous, transversely depressed between the (9–16) seeds when dry. Seeds horizontal, obovate-oblong, with a narrow linear areole on each face, compressed in the same plane as the valves; cotyledons enclosed between moderate layers of albumen, in transverse section of the seed extending from end to end, slightly sinuous or plane.—*C. bracteosa*, Welw. mss.

Nile Land. Madi, *Speke and Grant!* Abyssinia, *Rüppell.*
Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Manganya hills, *Dr. Meller!*

C. didymobotrya nearly resembles *C. venusta*, F. Muell. of North Australia. Schweinfurth and Ascherson, in Flor. Æthiop. 255, cite *Cassia glauca*, Lam., an Indian tree, as occurring in Sennaar. The leaflets are in 4–6 pairs, glaucous and puberulous or glabrate underneath, oval or elliptical obtuse or scarcely acute; glands interpetiolular; stipules linear, falcate. Flowers in corymbose racemes from the upper axils. Legume flat, broadly linear, 4–5½ in. long, 6–8 lines broad.

I have not seen African specimens.

16. **C. obovata,** *Collad. Hist. Cass.* 92, t. 15 A. Herbaceous, erect or ascending from a woody perennial stock 1–2 or even 3–4 ft. high, glaucous, wholly glabrous or the young extremities finely pruinose-puberulous. Stem pale green, terete or obtusely angular. Leaves 2–5 in. long; leaflets in 3–7 pairs, obovate to oblanceolate-oblong or obovate-elliptical, apex broadly rounded mucronulate, subcoriaceous, subsessile, $\frac{1}{2}$–$1\frac{1}{2}$ in. long; interpetiolular glands rudimentary or 0. Stipules obliquely lanceolate acuminate, spreading or decurved, persistent, $\frac{1}{6}$–$\frac{1}{4}$ in. long. Racemes erect, axillary, at length usually overtopping the leaves, rather laxly many-flowered. Pedicels $\frac{1}{6}$ in. Bracts rotundate-ovate apiculate $\frac{1}{6}$ in. long; caducous. Sepals rather unequal, very obtuse. Two of the anterior anthers considerably larger. Ovary appressed-tomentose. Legume flat oblong-reniform, broadly rounded at the extremity and obliquely tipped with the remains of the slender style; $1\frac{1}{4}$–$2\frac{1}{4}$ in. long, 7–10 lines broad; valves thinly coriaceous, glabrous or pulverulent, transversely marked with scarcely prominent anastomosing veins, and longitudinally over the seeds with a single series of rounded crest-like plaits. Seeds compressed obovate retuse; cotyledons plane, from end to end of the larger diameter of the seed. —For synonymy see Batka, Monog. Senna, 46, where is also a good figure (t. iii.)

Upper Guinea. Senegambia, *Perrottet!* Niger Expedition, *Barter!*
North Central. Kouka, *E. Vogel!*

Nile Land. Abyssinia, *Salt! Schimper!* Nubia, *Petherick! Bromfield! Kotschy!* and others. Sennaar, *Cienkowski.* Kordofan (*Schweinf. et Asch.*).

Lower Guinea. Benguela, *Dr. Welwitsch!*

Occurs eastward to N. W. India.

This species and *C. acutifolia* and *C. angustifolia* afford officinal senna.

17. **C. holosericea,** *Fresen. in. Flora,* 1839, 34. Shrubby; entire plant usually clothed with a very short rather dense or subvelvety pubescence. Branches ascending, terete, striate. Leaves 5–8-jugate, common petiole eglandular or glands rudimentary; leaflets broadly oblong or ovate-oblong, obtuse entire or retuse mucronulate, closely velvety-pubescent above and below, very shortly petiolulate; $\frac{1}{2}$–1 in. long. Stipules subulate, spreading, somewhat rigid, $1\frac{1}{2}$–2 lines long. Racemes erect, falling short of the leaves. Flowers apparently as in *C. obtusifolia* and *C. acutifolia.* Legumes flat, broadly falcate-oblong, rounded at the extremity with an oblique mucro indicating the style-base; 1–$1\frac{1}{4}$ in. long, 6–7 lines broad; valves thinly chartaceous, pubescent, unappendaged.—Batka, Monog. Senna, t. iv. (*Senna ovalifolia*); *C. pubescens,* R. Br. in Salt, Abyss. App. 64; *C. Schimperi,* Steud. Nom. Bot.; *C. cana,* Wenderoth in Linnæa, xii. 22. For further synonymy see Batka's "Monographie d. Senna."

Nile Land. Abyssinia, *Salt! Rüppell!* Nubia, *Schweinfurth!*

Also in Arabia and eastward to Scinde.

18. **C. acutifolia,** *Delile, Flore d' Egypte,* 75, t. 27, fig. 1. Shrub or undershrub with pale subterete or obtusely angled erect or ascending branches, occasionally slightly zigzag above, glabrous at least below. Leaves usually 4–5-jugate (3–7), common petiole eglandular, puberulous or glabrate; leaflets oval or lanceolate, acute, mucronate, usually more or less distinctly puberulous or at length glabrous, pale or subglaucous at least beneath, subsessile. Stipules subulate, spreading or reflexed, 1–2 lines long. Racemes axillary, erect, rather laxly many-flowered, usually considerably exceeding the subtending leaf. Bracts membranous, ovate or obovate, caducous. Pedicels at length 2–3 lines. Sepals obtuse, membranous. Two of the anterior anthers much exceeding the rest of the fertile stamens. Legume flat, very broadly oblong, but slightly curved upwards, obliquely stipitate, broadly rounded at the extremity with a minute or obsolete mucro indicating the position of the style on the upper edge; $1\frac{1}{2}$–$2\frac{1}{4}$ in. long, $\frac{3}{4}$–1 in. broad; valves chartaceous, obsoletely or thinly puberulous, faintly transversely veined, unappendaged. Seeds obovate-cuneate, compressed; cotyledons plane, extending the larger diameter of the seed in transverse section.—Batka, Monog. Senna, t. i. For synonymy see same work.

North Central. Timbuctoo and Sokolo (*Batka*).

Nile Land. Sennaar, *Kotschy!* Nubia, various localities, *Petherick! Speke and Grant!* and others. Kordofan, *Kotschy.*

Occurs also in Africa, north of the Tropic.

I follow Batka in adopting Delile's specific name for this plant. Those of prior date appear to be vitiated either by confusion of different species or citation of conflicting

synonyms. Much credit is due to Herr Batka for the pains which he has taken to unravel the entangled synonyms of this and other officinal "Senna" Cassias.

19. **C. angustifolia,** *Vahl, Symb. Bot.* i. 29. Very nearly allied to the preceding, the general description of which will apply, differing in the narrower oval-lanceolate leaflets which are wholly glabrous or the pubescence all but imperceptible, 1–2 in. long, and usually in 5 to 8 pairs, as well as in the narrower legumes which are usually 7–8 lines in breadth.—Batka, Monog. Senna, t. ii. *C. lanceolata,* Wight et Arn. Prod. Fl. Pen. Ind. Or. 288. For synonymy, see the same work.

Mozamb. Distr. Near Tette, "growing in the streets and on the rubbish-heaps," *Dr. Kirk!*

Extending eastward to the desert tracts of N. Western and Peninsular India. Doubtfully indigenous in Tropical Africa. A fragment is in the Kew Herbarium, from Dr. Livingstone, labelled from Central Africa, without precise locality.

20. **C. Absus,** *Linn.; DC. Prod.* ii. 500. A glandular-pubescent or pilose erect or ascending much-branched herb or undershrub, usually from 1–2 (–4) ft. in height. Leaves with 2 pairs of leaflets; common petiole slender, $1\frac{1}{2}$–3 in. long, patent-glandular-pilose throughout, interpetiolular glands small or rudimentary; leaflets membranous, varying from obliquely ovate or obovate to elliptic-oblong, obtuse, finely mucronate or sometimes broadly pointed, thinly pubescent or subglabrous. Stipules subulate. Flowers rather small, yellow or red, in short lax pilose or pubescent terminal or leaf-opposed racemes; bracts very small, persistent, ovate, often acuminate, shorter than the pedicels of $\frac{1}{6}$–$\frac{1}{4}$ in. Sepals subequal, linear-lanceolate, rather obtuse. Petals broadly oblanceolate to obovate, narrowed below. Stamens usually 4, 5 or 6, all perfect; anthers linear-oblong, dehiscing from the minutely mucronate apex more or less longitudinally. Legume 2-valved, linear, obliquely pointed at each end, $1\frac{1}{4}$–2 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad; valves slightly convex. Seeds 6–9, compressed oblique; cotyledons plane, extending the length of the larger diameter of the seed between layers of moderately thick albumen.—*C. viscosa,* Schum. et Thonn. Pl. Guin. 205; *C. Thonningii,* DC. Prod. ii. 500.

Upper Guinea. Senegambia, *Perrottet!* Quorra, *T. Vogel!* Nupe, *Barter!*
Nile Land. Abyssinia, *Schimper!* Upper Nile, *Petherick!* Gallabat, *Schweinfurth!* Kordofan, *Cienkowski.*
Lower Guinea. Angola, various provinces, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi, *Dr. Kirk!*
Common in Tropical Asia, extending to Australia.

21. **C. Grantii,** *Oliv.* Diffuse, spreading with wiry branches from a thick woody stock; branches terete, striate, thinly pubescent or sparsely patent-pilose. Leaflets 4–7-jugate; petiole pubescent, 1–$1\frac{1}{2}$ in. long, with 1 or 2 stipitate glands towards the base; broadly oblong, very obtuse mucronate, base very oblique truncate, glabrous or nearly so, 5–6 lines long. Common pedicels in pairs or solitary, supra-axillary, 1 in. long or less. Sepals (2–) 4–5 lines long, outer oval-oblong apiculate, inner elliptical obtuse. Petals about $\frac{1}{2}$ in. or less.

Stamens 10, perfect, anthers linear. Legumes linear, straight, flat, pubescent, 1–1½ in. long.

Mozamb. Distr. Maravi country, lat. 12° S., long. 34° E., *Dr. Kirk!* M'buiga, *Speke and Grant!*

Var. *pilosula.* Stem, leaf-rachis, and narrow subulate stipules thinly scattered with spreading hairs. Flowers small.

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

22. **C. zambesica,** *Oliv.* Nearly allied to *C. nigricans.* Branches slender, erect or ascending, the leaves thinly pilose with spreading weak hairs. Leaves nearly as in *C. nigricans*, the midrib of the leaflets more excentric and the basal gland on a slender stipes. Stipules persistent, lanceolate-subulate, 3–5 lines long. Pedicels solitary or in pairs, from a little above the axils, at length about ½ in. long. Flowers small, the outer finely acute sepals about 3 lines long. Legumes 1½ in., as in *C. nigricans.*

Mozamb. Distr. Zambesi, *Dr. Kirk!*

The difference in the gland of the petiole and the longer pedicels are, I suppose, of sufficient importance to separate this plant specifically from *C. nigricans.*

23. **C. nigricans,** *Vahl, DC. Prod.* ii. 498. Stem erect from a few inches to 2–3 or even 5 ft., terete, more or less sparsely pilose with weak spreading hairs exceeding a minute pubescence. Leaves distichous, 2–4 in. long; common petiole with a distinct or obscure sessile gland below the lowest pair; leaflets 8–18-jugate, linear to oval-oblong obtuse prominently mucronate, costa not far removed from the median line with few free lateral nervures converging longitudinally, finely pubescent or glabrate, usually from ½–1 in. long. Stipules persistent, lanceolate-subulate. Flowers very small, 3–5 lines diameter, solitary or 2–3–5 together on very short supra-axillary pedicels. Sepals 2 lines long, the outer acute, inner obtuse, sometimes apiculate. Petals subequal in length. Stamens 10, all perfect or 3 rudimentary; anthers linear, dehiscing at and towards the apex. Legumes erect, nearly straight, flat, 2-valved, shortly pubescent, 7–11-seeded, 1–1½ in. long, 2–2½ lines broad. Pedicels, in fruit, stout, 1–2 lines long. Cotyledons plane, extending from end to end of the larger diameter of the seed in transverse section; albumen thin.—*C. micrantha,* Guill. et Perr. Fl. Seneg. i. 262.

Upper Guinea. Senegambia, *Heudelot!*
North Central. Bilma and Kouka, *E. Vogel!*
Nile Land. Abyssinia, *Dillon and Petit! Schimper!* Gallabat, *Schweinfurth!* Upper Nile, *Petherick!* Kordofan, *Kotschy!*

Also in India.

Nearly allied to the Tropical American *C. Patellaria,* DC.

24. **C. mimosoides,** *Linn.; Vog. in Walp. Rep.* i. 837. An annual or frutescent and persisting a few years, various in habit, erect or diffuse, simple or much branched, pilose pubescent or nearly glabrous, occasionally attaining 2 or 3 ft. or more in height. Stem terete. Leaves from ½–4 in. in length, the larger forms often very narrow, occasionally

laterally compressed or cristate between the pairs, gland sessile shallow-saucer-shaped or flat below the lowest pair; leaflets from 10–80 pairs, linear- or oblong-falcate or nearly straight, usually with a distinct oblique mucro 1–3 (rarely 8) lines long; nervation not usually very prominent, obliquely longitudinal. Stipules finely subulate, straight, erect, from a lanceolate or ovate-lanceolate oblique base, persistent; up to $\frac{1}{2}$ in. in length. Pedicels slender, axillary, solitary or 2 or 3 together, unequal, usually from $\frac{1}{3}$–1 in. Buds pointed. Sepals subequal linear-lanceolate to oblong acute, and 3–4 (2–6) lines long. Petals subequal in length shortly clawed or subsessile, elliptical to rotundate, obtuse. Stamens all perfect (4–) 8–10, anthers linear much exceeding the filaments, dehiscing by terminal or shortly extended longitudinal slits. Legumes linear flattish $1\frac{1}{4}$–2 in. (1–3 in.) long, $1\frac{1}{2}$–$2\frac{1}{2}$ lines broad. Seeds oblique-rhomboidal compressed.—*C. microphylla*, Willd., DC. Prod. ii. 505; *C. geminata*, v. Schum. et Thonn. Pl. Guin. 208; *C. gracillima*, Welw. Apont. Phyto-geogr. No. 88.

Very common, although none of our numerous Tropical African specimens happen to be from the Central region of the Continent, over which, however, in suitable localities no doubt it is diffused.

C. mimosoides extends through Tropical Asia to Australia, and may be conspecific with some nearly allied Tropical American forms.

C. nictitans, Hochst. in Schimp. Pl. Abyss., may prove identical with the American species so named of Linnæus, but we want more ample material to determine. I find only 4 stamens in Hochstetter's plant.

25. **C. Kirkii,** *Oliv.* Erect or ascending, simple or branched, varying in height to probably a few feet. Branches terete pubescent or pilose. Leaves 3–6 in. long; common petiole pubescent or pilose-strigillose, with a sessile gland below the lowest pair; leaflets in 30–50 pairs, linear or linear-oblong obliquely pointed mucronate, finely nerved, about $\frac{1}{2}$ in. long, often with a glandular thickening at the sessile base. Stipules persistent, lanceolate-subulate or subulate, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Pedicels hairy 2 or more usually together, supra- or extra-axillary, $\frac{1}{4}$–$\frac{3}{4}$ in. long, with stipuliform bracts. Buds very acute. Outer sepals very acute, 4–6 lines long. Stamens 8–10 perfect; filaments very short; anthers linear, dehiscing at and near the truncate apex. Legumes linear, flat, 10–20-seeded, pubescent-pilose, $2\frac{1}{2}$–3 in. long, $2\frac{1}{2}$–3 lines broad.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Manganya hills, *Drs. Kirk and Meller!*

Nearly allied to the American *C. Chamæcrista*, L., of which, at first, I took it to be a variety. Mr. Bentham, however, who has recently completed a revision of this group of American Cassias, considers the African plant as distinct.

26. **C. falcinella,** *Oliv.* General characters of *C. mimosoides.* Stem much branched, thinly patent-pilose. Leaves $\frac{1}{2}$–$\frac{3}{4}$ in. long, the leaflets 8–11-jugate, decreasing much in size to the apex, excepting of the lowest pair oblong-falcate obliquely apiculate with a strong mucro, costa and nerves very prominent, the former almost marginal without lateral nervures on the upper side, nerves from the lower side of the

costa converging forwards; in the leaflets of the lowest pair the costa is nearly median; larger leaflets $\frac{1}{4}$ in. long. Common petiole apparently sometimes marked with sessile glands. Stipules rigid persistent, obliquely ovate-lanceolate, acuminate, falcate, very strongly longitudinally nerved, 4 lines long. Flowers solitary or in pairs, axillary, on pedicels of $\frac{1}{2}$–1 in. Sepals very acute, 4 lines long. Stamens 10, unequal, all perfect, anthers linear, dehiscing at or near the apex. Legumes immature in our specimen, pilose, similar to those of *C. mimosoides*.

Nile Land. Karaguè, *Speke and Grant!*

11. **DISTEMONANTHUS,** Benth. et Hook. f. Gen. Plant. i. 573.

Calyx-tube very short, turbinate; segments 5, linear acute, 3 outside in bud with 2 edges valvate (2 inside), slightly thickened at the margins. Petals 3, posterior oval or lanceolate, 2 lateral linear-oval. Antheriferous stamens 2 between the posterior and lateral petals; filaments rather thick compressed, anthers linear or slightly tapering above, basifixed, dehiscing by an oblique terminal pore; staminodia 3, posterior very short lanceolate, lateral elongate-linear opposite to the lateral petals. Ovary with a short thick stipes, 4–5-ovulate; style rather thick, as long as the ovary; stigma oblique terminal. Fruit not seen.—Tree. Leaves unfolding with the flowers, unequally pinnate; leaflets alternate. Flowers in axillary few-flowered cymes. Bracts small, narrow, very early caducous.

A monotypic genus, based upon Mr. Mann's specimens.

1. **D. laxus,** *Oliv.* A tree attaining 60 ft. Extremities at first thinly rusty-pubescent, at length glabrous, marked in our specimens with numerous lenticels. Leaves 4–8 in. usually 5–7-foliolate; leaflets membranous, elliptical or ovate- or oblong-elliptical acute or acuminate, rounded at the base in the larger leaflets, entire (or with 2 or 3 obscure lateral teeth ?), glabrous, $1\frac{1}{2}$–3 in. long, 10 lines–$1\frac{1}{4}$ in. broad; petiolules 1–2 lines. Flowers in axillary shortly pedunculate few-flowered cymes, sometimes confluent at the extremities forming a lax more or less leafy panicle. Pedicels puberulous, $\frac{1}{4}$ in. more or less. Calyx-lobes $\frac{1}{3}$–$\frac{1}{2}$ in. long, at length reflexed. Ovary hirsute.

Upper Guinea. Corisco Bay, *Mann!*

12. **DIALIUM,** Linn.; Benth. et Hook. f. Gen. Plant. i. 574.

Calyx-tube very short, dilated or turbinate, segments 5 equal or nearly so, much imbricate, deciduous. Petals not exceeding the calyx-lobes, 1 or 2 or 0, lanceolate or oblong entire. Stamens 2; filaments short, anthers elliptical or oblong, dehiscing longitudinally. Ovary (in African species) very shortly and obliquely stipitate, the stipes being laterally adnate to the disk; ovules 2 or exceptionally 3; style subulate; stigma terminal minute or scarcely dilated. Fruit roundish,

slightly compressed, indehiscent, with a fragile tomentose exocarp and pulpy endocarp, 1- or 2-seeded. Embryo with flat, or nearly flat cotyledons in a horny albumen.—Unarmed trees. Leaves unequally pinnate with usually 3–7 leaflets; leaflets alternate or opposite, entire. Stipules minute very early deciduous. Flowers small in axillary and terminal panicles. Bracts minute, caducous.

A small genus, common to the Tropics of both hemispheres. The following species are peculiar to Tropical Africa:—

Leaflets usually 5–7. Panicles usually branched to a 3rd degree . 1. *D. guineense.*
Leaflets usually 3. Tertiary panicle-branches obsolete or short . . 2. *D. angolense.*

1. **D. guineense,** *Willd. in Roem. Arch.* i. 30. t. 6. Tree of moderate size. Leafy extremities rusty-pubescent or -puberulous; leaflets coriaceous, usually 5 or 7, shortly petiolulate, varying from oval and ovate-lanceolate to elliptical or obovate-elliptical, apex narrowed to an obtuse or subacute point, or rounded and usually more or less obtusely apiculate, base more or less rounded or somewhat cuneate in the narrow-leaved forms, minutely pubescent on expansion but early glabrous and shining and finely reticulate above, pale or cinnamon-coloured (when dry) with or without minute appressed sparse pubescence and glandular papillæ beneath, 2–4 (5) in. long, $\frac{3}{4}$–$1\frac{1}{2}$ ($\frac{1}{2}$–2) in. broad; petiolule 1–$2\frac{1}{2}$ lines. Panicles many-flowered spreading terminal or from the upper axils often much overtopping the leaves, with the buds rusty-puberulous or -pubescent. Flowers 3–5 lines in diameter. Fruit $\frac{1}{2}$–$\frac{3}{4}$ in. in diameter, covered with a short velvety tomentum, 1- or 2-seeded; the seeds embedded in a pleasantly acid pulp.—*D. nitidum*, Guill. et Perr. Fl. Seneg. i. 267, t. 58. *Codarium acutifolium* and *C. obtusifolium*, Afz., DC. Prod. ii. 520. *C. discolor*, DC. l.c. *Dialium discolor*, Hook. f., Fl. Nigrit. 329. *Codarium Solandri*, Vahl, Enum. i. 302.

Upper Guinea. Senegambia and Sierra Leone, various collectors. Abbeokuta, *Dr. Irving!* Gold Coast, *Hove!* Niger. *T. Vogel! Barter!* Princes Island, *Mann!*

This plant varies considerably in the form of the leaflets, and probably also in the size of the small flowers. A form in which the flowers are usually dipetalous, is the *D. discolor*, cited above.

The fruit is the "Velvet Tamarind" of Sierra Leone.

2. **D. angolense,** *Welw. mss.* A tree of 20–35 ft. or taller, with a trunk often 1–2 ft. in diameter; extremities tawny- or ferruginous-pubescent. Leaves almost invariably 3-foliolate; leaflets very coriaceous, on both surfaces closely and prominently reticulate, varying from ovate-lanceolate to elliptical, shortly broadly and obtusely acuminate, rounded or broadly cuneate at base, at length glabrous or sparsely and shortly hairy at least on the midrib beneath, $1\frac{1}{2}$–3 in. long, $\frac{5}{6}$–$1\frac{1}{2}$ in. broad; pubescent petiolules $1\frac{1}{2}$–2 lines. Flowers numerous, yellowish, in terminal pubescent tomentose panicles, leafy below, less intricate than in *D. guineense*, branches of the panicle either simple racemes or the ultimate branchlets usually very short or obsolete. Pedicels 1–$1\frac{1}{2}$ lines. Calyx spreading, 4–5 lines in diameter. Petals

1, 2 or (usually) 0. Fruit, judging from immature specimens, similar to that of *D. guineense*.

Lower Guinea. Angola province, Pungo Andongo, *Dr. Welwitsch!*
This may prove a race of the foregoing.

13. **BANDEIRÆA,** Welw.; Benth. et Hook. f. Gen. Plant. i. 577.

Calyx-tube elongate, dilated or campanulate above, 5-toothed or 5-lobed. Petals 5, subequal, imbricate, oval or oblanceolate. Stamens 10, all antheriferous, free, alternately shorter; filaments pubescent below; anthers uniform, dehiscing longitudinally. Ovary compressed on a long slender stipes; style short, with a small terminal stigma; ovules about 4. Legume coriaceous, turgid, 2-valved. Seeds exalbuminous, flattened transversely to the axis of the legume; cotyledons round, flat, with the small short radicle slightly projecting from their emarginate base; testa thinly coriaceous.—Climbing shrubs. Leaves simple, 1-foliolate, entire, penniveined, or with the two lateral basal nervures prolonged, subtrinerved. Flowers in terminal or extra-axillary simple erect racemes, occasionally panicled at the ends of the branches.

Confined to West Tropical Africa. It is not improbable that the following may prove forms of one species:—

Leaves triplinerved. Racemes hoary or puberulous.	
Racemes terminal, overtopping the leaves, panicled. Legume rather longer than gynophore	1. *B. speciosa.*
Racemes terminal and lateral, extra-axillary, shorter than or not much exceeding the leaves	2. *B. simplicifolia.*
Leaves scarcely 3-nerved. Racemes wholly glabrous. Legume rather shorter than gynophore	3. *B. tenuiflora.*

1. **B. speciosa,** *Welw.; Benth. in Linn. Trans.* xxv. 306, t. 40. A much-branched climbing shrub or occasionally tree-like; extremities at first hoary, at length glabrous. Leaves oval or elliptic-oblong, obtuse and shortly and obtusely apiculate, thinly coriaceous, glabrous, shining above, one or two pairs of the lower lateral veins prolonged about half the length of the leaf, much fainter than the midrib, 2–4 in. long; petiole short, 2–3 lines. Racemes short, densely many-flowered, hoary-puberulous, collected in terminal leafy panicles. Flowers drooping, crimson-purple, on pedicels of 2–3 lines. Bracts and bracteoles minute, caducous. Calyx-tube $\frac{3}{4}$ in. long, obliquely obtuse at base, dilated above into the broadly campanulate limb. Petals oblanceolate clawed, lamina $\frac{1}{4}$–$\frac{1}{3}$ in. long. Stamens equalling the petals. Ovary obliquely pointed, stipitate, at length exserted; ovules 3 or 4, confined to the lower part of the suture. Legume turgid, black and shining, 2–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–1 in. diameter, on a stipes affixed to one side of the obtuse base $\frac{3}{4}$ in. long, styline apiculus lateral; valves on dehiscence somewhat involute, thin but hard and woody. Seeds black, flat, roundish, disposed in a plane at right angles to the axis of the legume, $\frac{1}{2}$–$\frac{2}{3}$ in. in diameter.

Lower Guinea. Golungo Alto, Angolo, *Dr. Welwitsch!* Congo, *Smith!*

2. **B. simplicifolia,** *Benth. in Linn. Trans.* XXV. 306. Branching shrub, with glabrous shining branches. Leaves subcoriaceous, shortly petiolate, ovate-oblong, obtuse or rounded above, 3-nerved, glabrous, shining, 2 in. long. Racemes dense, erect, terminal or extra-axillary, on long peduncles, with the calyx hoary-tomentose. Calyx-tube gradually dilating, ventricose and 5-fid above. Petals ovate-oblong, obtuse, shortly clawed, spreading, greenish. Filaments pubescent below. Gynophore equalling the petals, filiform.—*Schotia simplicifolia*, Vahl; DC. Prod. ii. 508; Schum. et Thonn. Pl. Guin. 212.

Upper Guinea. Gold Coast, *Thonning*.

The above description is taken from Schumacher and Thonning. I have not seen a specimen. Dr. Baillon figures in Adansonia, vi. 2, fig. 1, a specimen of Vahl's type from the Jussieuan Herbarium. The racemes are represented as lateral, extra-axillary, ascending and shorter than or scarcely equalling the leaves, as well as terminal. The trinervation of the leaves is conspicuous, the lateral nervures considerably within the margin and evanescing above the middle. In the herbarium of the British Museum is a *Bandeiræa* from Cape Coast (*Brass*), in which the leaves are less distinctly 3-nerved than in *B. speciosa*, and the racemes shorter, though exceeding the leaves. I think this probably *B. simplicifolia;* indeed I much doubt if *B. speciosa* be specifically distinct.

3. **B. tenuiflora,** *Benth. in Linn. Trans.* XXV. 307. Climbing shrub, attaining 15–20 ft., glabrous throughout. Leaves thinly coriaceous, subsessile, elliptic-oblong, shortly and rather obtusely acuminate or cuspidate or obtuse, shining above, venation prominent beneath, the lowest pair of lateral nervures intramarginal, and inconspicuous above; 2–5 or occasionally 6 in. long, 1–2$\frac{1}{3}$ in. broad; petiole $\frac{1}{2}$–2 lines. Racemes many-flowered, terminal, pedunculate. Bracts ovate-lanceolate, acute, deciduous, 1 line long. Pedicels $\frac{1}{4}$–$\frac{1}{3}$ in. Calyx-tube $\frac{3}{4}$–1 in. long, glabrous, sulcate below when dry, campanulate and shortly deltoid-toothed above. Petals oval or oblanceolate, narrowed below, $\frac{1}{2}$ in. long. Filaments filiform, glabrous. Ovary shortly and broadly oblong, on a very slender stipes, projecting $\frac{1}{2}$ in.; ovules 4. Legume (immature?) in the specimen, $\frac{1}{2}$–$\frac{2}{3}$ in. long, rounded above, bearing laterally the slender subulate style; 1–1$\frac{1}{2}$ lines long, much inflated, thinly crustaceous, black, smooth and glabrous.—*Griffonia physocarpa*, Baill. in Adansonia, vi. 188 t. 2, figs. 2–5.

Upper Guinea. Fernando Po, *Mann!*

14. **BAUHINIA**; Linn.; Benth. et Hook. f. Gen. Plant. i. 575.

Calyx-tube turbinate, campanulate to elongate-cylindrical, limb spathaceous or 5-toothed, -lobed, or -partite. Petals 5, subequal, or posterior smaller, sometimes with a bifid basal callus, imbricate in æstivation. Stamens 10 or fewer, 2, 4–5 or all antheriferous; filaments of perfect stamens free or nearly so, unequal; anthers ovate-oblong or linear, dehiscing longitudinally. Ovary stipitate or subsessile, 2–∞-ovulate; style slender, filiform, or very short; stigma terminal, dilated and obliquely peltate or inconspicuous. Legume oblong or linear, coriaceous or woody indehiscent or 2-valved, 2–∞-seeded. Seeds compressed,

albuminous; cotyledons flat, fleshy.—Trees or shrubs, erect or scandent, the extremities or inflorescence occasionally cirrhose. Leaves 2-foliolate; leaflets usually more or less connate (forming an apparently simple bilobate 5–11-nerved leaf). Stipules in the Tropical African species caducous or inconspicuous. Flowers 2 or 3 together on leaf-opposed or terminal peduncles, or collected in simple or compound corymbs racemes or panicles, white or rose to purple and yellow.

A large Tropical genus. The following species appear to be endemic, with the exception of *B. tomentosa.*

Perfect stamens usually 2. Posterior petal with erect bifid basal callus. Calyx-limb 5-lobed. (*Tylosema*, Schweinf.)
- Leaves glabrous. Calyx-lobes all prominently keeled . . . 1. *B. fassoglensis.*
- Leaves tomentose beneath.
  - Bracts linear, $\frac{1}{3}$–$\frac{1}{2}$ in. Calyx-lobes distinctly keeled towards apex.
    - Calyx-lobes 2–3 times longer than tube. Anterior petals 2–4 times exceeding calyx . . . . . 2. *B. cissoides.*
    - Calyx-lobes 4–6 times longer than tube. Anterior petals not twice as long as calyx. . . . . 3. *B. Welwitschii.*
  - Bracts ovate, 1–2 lines. Calyx-lobes not, or faintly, keeled . 4. *B. Kirkii.*

Perfect stamens 5 (or 4). Calyx-tube cylindrical, limb spathaceous.
- Petals linear or oblanceolate, narrowed to base, not $\frac{3}{4}$ in. broad . 5. *B. Petersiana.*
- Petals ample, $\frac{3}{4}$–$1\frac{1}{2}$ in. broad, cordate or abruptly clawed at base 6. *B. macrantha.*

Perfect stamens 10, or rarely 8.
- Calyx tube cylindrical, limb spathaceous . . . . . 7. *B. Bowkeri.*

Calyx-tube short, campanulate or infundibuliform.
- Flowers white. Calyx-limb spathaceous or lobes irregularly cohering. Leaves very small (not 1 in. diameter) . . . 8. *B. rufescens.*
- Flowers yellow. Calyx-limb spathaceous. Leaves membranous ($1\frac{1}{2}$–3 in. diameter), glabrous or pubescent . . . 9. *B. tomentosa.*
- Flowers white or rose. Calyx 5-fid, lobes deltoid or ovate.
  - Flowers in compound tomentose racemes. Leaves coriaceous (3–5 in. diameter) . . . . . 10. *B. reticulata.*
- Flowers yellowish, purple-veined. Calyx 5-toothed, teeth deltoid. Flowers axillary, solitary or geminate, glabrous.
  - Leaves rounded ($\frac{3}{4}$–$1\frac{1}{3}$ in. diameter) . . . . . 11. *B. garipensis.*

Imperfectly known species, p. 292.

1. **B. fassoglensis,** *Kotschy; Schweinf. Rel. Kotsch.* 14, t. 12, 13. Extremities glabrescent, at first thinly pilose with appressed rusty deciduous hairs. Leaves firmly membranous, suborbicular, $2\frac{1}{2}$–$4\frac{1}{2}$ in. broad, with a deep often narrow basal sinus; leaflets connate three-fourths of their length or more, rounded above and below, each with 4 divaricately forking nerves, glabrous or nearly so, paler or subglaucous beneath. Flowers in pedunculate terminal or leaf-opposed, rather lax many-flowered simple racemes, with the peduncle 9 in.–1 ft. long. Bracts lanceolate or subulate, 2–3 lines long, deciduous. Pedicels $\frac{3}{4}$–2 in., ascending, recurved at the apex, at least in bud. Calyx rusty-pubescent, deeply 5-fid, lobes oblong-lanceolate, acute, all strongly carinate, twice or thrice as long as the short campanulate tube. Larger petals rotundate, $\frac{3}{4}$–1 in. diameter, with divergent forking nervures, narrowed into a short claw. Posterior petal with erect obtuse very

prominent bifid callus, channelled in front, enclosing the posterior staminode, the filament of which is abruptly dilated in the middle. Two stamens perfect with straight filaments, incurved at the tip, and incurved oblong anthers dehiscing on the inner face. Shorter stamens variously deformed or effete. Ovary biovulate, narrowed into a slender style curved above.

Nile Land. Gallabat, *Dr. Schweinfurth!* Sennaar, *Cienkowsky!*
Mozamb. Distr. Manganya hills, Zambesia, *Mr. Waller!*
Var. *pilosula.* Branches and petioles thinly pilose with short spreading hairs. Zambesi land, *Dr. Kirk!*
Distributed by Dr. Schweinfurth in his Nubian and Abyssinian collection under the MS. name, *B. scandens*, Kotschy.

2. **B. cissoides,** *Welw. mss.* A climbing rusty-tomentose or pubescent shrub; extremities sulcate or obtusely angular, the ridges occasionally at length glabrate. Leaves firmly membranous, suborbicular or transversely dilated, 3–7 in. broad, basal sinus usually narrow (segments sometimes overlap), extending about one-third the length of leaf, apical sinus very broad and shallow or apex entire; leaflets broadly rounded above and below each with 5–7 strong divaricately forking nervures beneath, glabrous sometimes glaucous above, tomentose or tomentose-pilose on the under surface and petioles which vary from 2–6 in. in length. Racemes pedunculate, laxly 6–18-flowered, clothed with ferruginous tomentum, with the peduncle $\frac{1}{2}$–1 ft. long. Bracts narrow, $\frac{1}{4}$–$\frac{1}{2}$ in. long, usually present at flowering. Pedicels ascending, or at length patent, sometimes slightly recurved towards the apex, 1–2 in. long. Buds ellipsoidal, rather obtuse, $\frac{3}{4}$ in. long. Calyx-tube campanulate, about $\frac{1}{3}$–$\frac{1}{2}$ as long as the linear segments, which are more or less distinctly dorsally carinate towards the apex. Anterior petals yellow or orange, pilose externally, rotundate, clawed, 2–4 times longer than the calyx; posterior petal with a prominent erect narrow bifid callus, nearly 2 lines in length. Fertile stamens usually 2. Ovules 2. Legume flat at right angles to the gynophore of $\frac{1}{2}$ in. in length, obliquely obovate or rotundate, rounded or apiculate at the apex, 2-valved, valves hard, smooth, or faintly ridged transversely, the ventral suture but inconspicuously thickened; valves consolidated towards the apex and dorsal suture, $3\frac{1}{2}$–4 in. long, $2\frac{1}{2}$ in. broad. Seeds not examined.

Lower Guinea. Ambaca and Pungo Andongo, Angola, *Dr. Welwitsch!*

3. **B. Welwitschii,** *Oliv.* A procumbent or scandent shrub, with the general characters of *B. cissoides*, and like it clothed on the stem, petioles and inflorescence with a tawny or ferruginous tomentum. Leaves usually with a broader basal sinus, and the midrib sometimes excurrent at the apex in a fine apiculus; 4–6 in. broad; petioles $1\frac{1}{2}$–6 in. Racemes as in *B. cissoides.* Bracts linear-subulate, $\frac{1}{2}$ in. long more or less. Pedicels 1–2 in. Buds lanceolate or ovoid-lanceolate, 1 in. long on expansion. Calyx-lobes long and narrow-linear, the two posterior segments sometimes late cohering, 4–6 times as long as the tube, all more or less dorsally crested above. Anterior larger petals obovate or

rotundate, narrowed into the claw, not twice as long as the calyx; callus of posterior petal broader and much more rounded in profile than in *B. cissoides*. Legume (only seen immature) apparently as in the foregoing though probably longer in proportion to its breadth.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Flowers at length blood-red.
Perhaps the same plant from the province Huilla.

4. **B. Kirkii,** *Oliv.* Climber; rusty- or cinnamon-tomentose. Leaves submembranous, about 5 in. broad by 4 in. long, with a deeply cordate base, the basal sinus extending about $\frac{1}{3}$ towards the shallow broadly bilobed apical sinus; leaflets connate over 2 in. (in our only specimen), broadly rounded above and below, glabrous and reticulate above, softly pilose-tomentose beneath; petiole 2 in. Flowers showy yellow on patent or recurved leaf-opposed peduncles, with the $\frac{1}{2}$–1 in. pedicels and calyx outside tomentose. Bracts ovate acute, 1–2 lines. Calyx-tube campanulate, shorter than the nearly equally 5-lobed limb, lobes at length free, $1\frac{1}{2}$ to twice as long as the tube, glabrous within, the 2 posterior lobes slightly carinate. Petals considerably exceeding the calyx, obovate, gradually narrowed to the claw, pilose externally, reticulate, with divergent venation; posterior petal with a bifid basal callus. Stamens unequal, 2 perfect at length much longer than the rest, with linear-subulate or filiform glabrous filaments incurved above and oblong glabrous anthers dehiscing on the inner face; anthers of 8 shorter stamens variously deformed or effete; 2 intermediate stamens with dilated filaments. Gynophore equalling or exceeding the ovary, which is glabrous, excepting on the suture, and biovulate. Legume not seen.

South Central. Highlands of Batoka, *Dr. Kirk!*
Dr. Kirk states that the "large astringent" roots and the seeds are eaten by the natives, who call the plant "Marama, the beans Litamane."
Not known from elsewhere, though nearly allied to *B. Burkeana*, Benth., a Cape species, as well as to *B. cissoides*, Welw.

5. **B. Petersiana,** *Bolle in Peters' Mossamb. Bot.* 24. Extremities terete, pubescent or puberulous. Leaves $2\frac{1}{2}$–3 (4) in. broad, firmly membranous, broadly bifid, broadly cordate at the base, 7-nerved; leaflets connate $\frac{3}{4}$–2 in., rounded at each end, glabrous above, slightly pubescent at least on the nervures or glabrescent beneath, with a glandular or biglandular disk at the insertion of the petiole which is $\frac{1}{2}$–$\frac{3}{4}$ in. long. Corymbs few- or several-flowered, terminal or on short lateral shoots; pedicels very short. Calyx shortly tawny-tomentose, tube cylindrical sulcate $\frac{3}{4}$–$1\frac{1}{4}$ in. long, limb spathaceous, equalling the tube, the lobes occasionally partially separating. Petals subequal, linear-oblanceolate, narrowed to the pilose or pubescent claw, penni-veined with a conspicuous midrib, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long. Perfect stamens 5, unequal, filaments slender elongate pilose below, anthers linear affixed $\frac{1}{4}$–$\frac{1}{2}$ from the base; 5 shorter stamens free or partially connate, with reduced or effete anthers. Gynophore elongate, $\frac{3}{4}$–$1\frac{1}{2}$ in. Ovules 10–12. Style slender; stigma capitate. Legume not observed.

Mozamb. Distr. Zambesi land, near Senna, *Dr. Peters!* Foot of Moramballa, *Dr. Kirk!* Manganya hills, *Waller!*

The flowers Bolle describes as red; Dr. Kirk as white. A good coloured drawing accompanies Dr. Kirk's specimens.

6. **B. macrantha,** *Oliv. sp. nov.* Shrub of 4–5 ft., extremities pubescent-tomentose. Leaves thinly coriaceous, the upper about 1½ in. broad, slightly cordate at base; leaflets obliquely ovate or ovate-oblong, rounded above and below, connate ⅓ or ½ their length, each 3-nerved, sparsely pubescent and reticulate above, paler and pubescent beneath; petioles very short tomentose. Flowers very large, 2 or 3 together on short terminal or leaf-opposed peduncles; bracts short, linear-subulate. Calyx shortly tomentose, tube narrowly cylindrical, sulcate, 1 to nearly 2 in. long, limb spathaceous ovate, tipped by the free subulate apices of the lobes. Petals ample, 1½–2½ in. long, obovate cordate at the base or abruptly narrowed into the short claw, penniveined from a prominent deliquescent midrib. Perfect stamens 4–5 with elongate slender filaments thinly pilose below and linear straight glabrous anthers; abortive stamens much shorter, several connate in a short phalange. Ovary many-ovuled on a gynophore of 1 in. more or less; style slender, stigma capitate. Legume not seen.

South Central. *Desert by Lake Ngami, McCabe!*

7. **B. Bowkeri,** *Harv. Fl. Capensis,* ii. 596. Shrub or small tree, unarmed; extremities puberulous or early glabrate. Leaves ½–1⅓ in. long, ¾–1½ in. broad, slightly cordate or truncate at base, leaflets broadly obliquely oblong ovate- or obovate-oblong, rounded above and below, connate from 1 or 2 lines to half their length, glabrous or sparsely pubescent and reticulate above, paler or glaucous pubescent or glabrate beneath. Flowers rather large, white, terminal and from the upper axils, usually in few-flowered leafy corymbs; pedicels very short. Calyx puberulous or shortly tomentose, tube cylindrical elongate sulcate, limb spathaceous, ¾–1¼ in. long, shorter than or nearly equalling the tube. Petals 1¼–2 in., oblanceolate, narrowed into the claw, with a strong midrib and conspicuously penniveined. Stamens 10, all perfect, unequal; filaments filiform. Ovary on a long gynophore, narrowed above into the slender pubescent style; stigma capitate. Legume not seen.

South Central. *Chapman and Baines!*

Found also in Caffraria.

8. **B. rufescens,** *Lam.; DC. Prod.* ii. 514. Much and divaricately branched shrub or small tree; extremities minutely puberulous or glabrous. Leaves very small, usually under 1 in. in diameter, rather coriaceous; leaflets free nearly or quite from the base, obliquely and broadly oblong or more or less ovate or obovate, rounded at each end, 3-nerved, minutely setulose-puberulous or glabrate and reticulate beneath; petiole 2 lines to ½ in. Flowers small, white, fragrant, in terminal racemes or corymbs; pedicels 1/10–½ in. Calyx-tube campanulate, 2 lines long, limb spathaceous, twice as long as the tube, the

lobes at length sometimes partially free. Petals linear-oval, narrowed to each end, penniveined from a broad obscure midrib. Stamens 10, all perfect; filaments slender with a hairy tuft on the inner side at the base; anthers oblong, thinly pilose. Ovules 7–10–12. Style much shorter than the ovary, or stigma subsessile. Legume several-seeded, linear, coriaceous, but slightly turgid, valves faintly depressed between the seeds when dry, often curved or falcate, apiculate, narrowed at the base into a gynophore of $\frac{1}{4}$–$\frac{1}{2}$ in., $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. broad. Seeds shining, compressed, albuminous; cotyledons flat.—*B. parvifolia*, Hochst. in Hb. Nub. Kotsch.; Fielding et Gardner, Sert. Pl. t. x.

Upper Guinea. Senegambia, *Heudelot!* Gambia, *Whitfield!* Borgu (in a town only), *Barter!*

North Central. Kouka, *E. Vogel!*

Nile Land. Nubia, Sennaar, *Kotschy!* and others. Abyssinia, Bahr-el-Abiad, (*Schweinf. et Asch. Enum.*).

With this species Dr. Schweinfurth identifies Senegambian specimens distributed under the unpublished name of *B. divaricata*, Guillemin.

9. **B. tomentosa,** *L.*; *DC. Prod.* ii. 514. Shrub with slender pubescent or puberulous often pendulous branches. Leaves membranous, usually $1\frac{1}{2}$–3 in. broad, in some forms considerably smaller, in others larger, base cordate with a broad shallow sinus or truncate, usually 7-nerved, with a bilobed glandular disk at the insertion of the petiole; leaflets rounded above and below, connate $\frac{1}{2}$–$\frac{2}{3}$ their length, glabrous above, paler or somewhat glaucous minutely tomentose pubescent or glabrate beneath; petiole usually $\frac{1}{2}$–1 in. Stipules subulate. Flowers showy yellow, in few-flowered terminal corymbs or on 1–2-flowered leaf-opposed peduncles. Calyx-tube short funnel-shaped $\frac{1}{4}$ in. long or less, limb spathaceous, exceeding the tube. Petals 1–$2\frac{1}{2}$ in. long, obovate or obcordate, subsessile or shortly clawed, venation divergent not prominent. Stamens 10, unequal, all antheriferous, filaments filiform. Gynophore short, rarely exceeding $\frac{1}{4}$–$\frac{1}{3}$ in. Style elongate; stigma capitate. Legumes coriaceous, much compressed or flat, often 6–12-seeded, broadly linear, acuminate or cuspidate, often narrowed at the base.—Bot. Mag. 5560 (var. *glabrata*); *B. Mucôra*, Bolle in Peter's Mossamb. Bot. 22; *Alvesia bauhinioides*, Welw. Apont. Phytogeogr. No. 47.

Lower Guinea. *Mr. Monteiro!* Pungo Andongo, Loanda, and Golungo Alto, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi, *Dr. Kirk!*

Also in Natal and in Tropical Asia.

Dr. Welwitsch collected on the Sugar-loaf Mountain, Sierra Leone, a specimen of *B. acuminata* (L.), Wt. and Arn., an Indian species; most likely introduced. It differs from *B. tomentosa* in its pointed leaflets, and smaller flowers with oval or oblanceolate penniveined petals.

10. **B. articulata,** *DC. Prod.* ii. 515. A spreading tree; extremities unarmed, rusty-tomentose or pubescent. Leaves coriaceous, usually 3–5 in. broad, 11- or 9-veined, with a conspicuous bilobed gland when dry at the broadly cordate base; leaflets connate, $\frac{2}{3}$–$\frac{4}{5}$ of their length,

broadly rounded below, rounded or more rarely broadly pointed above, often somewhat glassy, glabrous or at first puberulous above, tawny- or rusty-pubescent with prominent nervures and ultimate areolate-reticulate venation beneath; petiole pubescent or tomentose, 1–2 in. Flowers rather small, in terminal or leaf-opposed compound tomentose racemes shorter than or slightly exceeding the leaves. Bracts very small, ovate, acute or lanceolate, caducous. Lateral branches of raceme usually 1–6 lines. Buds somewhat pyriform, $\frac{1}{2}$ in. or less. Calyx 5-fid, lobes ovate or deltoid, distinct or occasionally cohering. Petals subequal, whitish or rose, rotundate or obovate, pilose externally, shortly and abruptly clawed. Stamens 10, all, or nearly all, perfect, unequal, filaments glandular or pilose below, anthers oblong. Ovary stalked. Stigma capitate, sessile or subsessile. Legume varying from broadly oblong, $2\frac{1}{2}$–3 in. broad, to elongate linear-oblong, 1–$1\frac{1}{4}$ in. broad, $\frac{1}{3}$–1 ft. long, often irregularly constricted, apiculate, on a gynophore of $\frac{3}{4}$–1 in.; valves, when mature, stoutly coriaceous, tawny- or rusty-tomentose, or at length glabrous, showing the obscure or more or less distinct, anastomosing, obliquely transverse, or toward the centre longitudinal, nervures of the valve. Seeds indefinite, embedded in the corky endocarp.—Fl. Seneg. i. 266, t. 60; *B. Thonningii*, Schum. Guin. Pl. 203; *B. pyrrhocarpa*, Hochst. in Flora, 1844, 99 and Hb. Schimp. Abyss.; *B. abyssinica*, Rich. Fl. Abyss. i. 253; *B. inermis*, Hb. Schimp. Abyss. 712 (1839); *B. tamarindacea*, Delile, Voy. à Méroé, 31; *Locellaria bauhinioides*, Welw. Apont. Phyto-geogr. No. 52.

Upper Guinea. Senegambia, *Perrottet!* Cape Verd, *Brunner!* Niger, *Barter!* Ashantee, *Thonning.* Abbeokuta, *Irving!*

Nile Land. Abyssinia, *Dillon, Schimper!* Gallabat, *Schweinfurth!* Sennaar, *Cienkowski.*

Lower Guinea. Congo, *Smith!* Various provinces of Angola, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi and Rovuma, *Dr. Kirk!* Shire river, *Dr. Meller!*

The bark yields a tough fibre; it is also astringent and used in medicine.

The Nile Land plant differs in a proportionately narrower legume, varying from 1–$1\frac{1}{4}$ in. in breadth, and from a few inches to 1 ft. in length; but from an examination of the suite of specimens in the Kew Herbarium, I can hardly suppose this to indicate specific distinction.

Specimens, in fruit only, collected near Kouka in North Central Africa by E. Vogel, differing from the usual form of *B. reticulata* in being glabrous, the twigs and pods more or less glaucous or plumose, probably belong to a marked variety of this species, and may be the *B. Benzoin* of Kotschy, described from fruiting specimens only. (Schweinf. Rel. Kotsch. 12, t. 11.)

To the same form, whether variety or distinct species, is referred the plant noticed by Dr. Schweinfurth (Fl. Æthiop. 3[illegible], as collected by Kotschy at Milbes, and distributed as "*B. tamarindacea*, Del.?" corresponding with a Senegambian plant bearing the MS. name *B. platysiliqua*, Guillemin. I have not seen either of these.

11. **B. garipensis,** *E. Mey. Comm.* 162. A shrub of 5–8 ft., with long slender, rod-like, ashen-white or farinose terete branches. Leaves thinly coriaceous, glaucous, usually from $\frac{3}{4}$–$1\frac{1}{3}$ in. broad, $\frac{1}{2}$–$\frac{3}{4}$ in. long; sinus at base and apex broad and shallow, 5-nerved with obscure venation; petiole slender, 3–4 lines. Flowers usually solitary or geminate from obsolete axillary peduncles; pedicels $\frac{1}{4}$ in. or less. Calyx deeply

companulate, thin, glabrous, shortly 5 deltoid-toothed. Petals 5, erect, exserted ⅓ in., obliquely oblanceolate or obovate-oblong, narrowed into the claw, beautifully purple-reticulate with a narrow veinless margin. Stamens 10, antheriferous, filaments glabrous; anthers elliptic-oblong. Ovary and gynophore smooth, glabrous (or glandular); ovules indefinite in 2 or more series. Legume flat, 2-valved, shortly falcate-oblong or subreniform, the dorsal suture broadly rounded; slender style persisting at one side of the apex; valves glabrous, transversely reticulate. Seeds few.

Lower Guinea. Mossamedes, *Dr. Welwitsch!*
Also in Namaqua-land and on the Gariep.

Imperfectly known Species.

B. punctata, *Bolle in Peters' Mossamb. Bot.* 23. An unarmed shrub; extremities and petioles minutely pubescent. Leaves coriaceous, orbicular, 9-nerved, truncate at base; leaflets connate nearly throughout or shortly bilobate, rounded above, upper surface smooth and shining, lower clothed with short appressed hairs and golden-yellow spots. Flowers in twos or threes, terminal or leaf-opposed, on long peduncles. Calyx spathaceous, 2-valved. Petals rotundate, with a claw of ½ in. Filaments glabrous. Ovary stipitate tomentose.

Mozamb. Distr. Zambesi, *Dr. Peters.*
Abstracted from the work cited. The form of the calyx-tube is not stated, nor the number of antheriferous stamens.

B. Adansoniana, *Guill. et Perr. Fl. Seneg.* i. 265. "Leaves 2-fid, 7-nerved from an ovate or subrotund base, lobes lanceolate obtuse pubescent. Legume linear subtorulose."

Upper Guinea. Senegambia, *Adanson.*
Unknown to me.

B. acuminata, *Bruce, Trav. Abyss. App.* 167, t. 18.

This plant, the "*Farek*" of Bruce, I cannot identify. The leafage, calyx and petals at any rate, are those of a *Bauhinia*, while the pistil is unlike that of any species known to me. *B. acuminata* is represented with distinctly cordate leaves, the leaflets connate ¼–⅓ their length, and gradually narrowed to a rather obtuse apex. Flowers in a short extra-axillary peduncled corymb or raceme. Calyx spathaceous. Petals ovate-lanceolate or oval clawed. Perfect stamens 10.

15. **BERLINIA,** Solander; Benth. et Hook. f. Gen. Plant. i. 579.

Buds enclosed between a pair of valvate bracteoles until flowering. Calyx-tube short or elongate, segments 5, subequal, imbricate. Posterior petal nearly equalling the rest in length or much longer, usually distinctly clawed, with an entire or bilobate lamina; lateral and anterior petals similar to the posterior or much smaller, diverse in form, shorter than or exceeding the calyx. Stamens 10, all perfect or 5 alternating with as many rudimentary staminodia; in the decandrous species the posterior stamen free from the base, the rest usually very shortly coherent; filaments slender, elongate, anthers oblong or elliptical, dehiscing longitudinally, versatile. Ovary shortly or distinctly stipitate; style

slender, elongate or occasionally not longer than the ovary; stigma terminal, capitellate or peltate. Ovules usually 4–8. Legume 2-valved, flat, coriaceous. Seeds . . . .—Unarmed trees. Leaves abruptly pinnate. Stipules various, in one species large, subpersistent, in others small or inconspicuous and caducous. Flowers usually handsome, white or whitish, in terminal, solitary or panicled often corymbose racemes. Bracts deciduous or caducous. Bracteoles geminate, large, obovate or oblanceolate, valvate, enclosing the bud, spreading or deciduous at flowering.

Confined to Tropical Africa. See remark under *Macrolobium.*

Stamens 10, all perfect.
- Posterior petal conspicuously larger than the rest.
  - Involucral bracteoles 1–1¾ in. long. Pedicels ½–3 in. . . . 1 *B. acuminata.*
  - Involucral bracteoles ¾ in. or less. Pedicels ⅓–½ in. . . . . 2. *B. auriculata.*
- Petals equal or but slightly unequal in length.
  - Bracts 2–2½ in. Petals 2–3 in., all distinctly clawed . . . 3. *B. bracteosa.*
  - Bracts small, ⅓ in. or less. Petals about ½ in., shortly clawed or sessile.
    - Calyx-tube 1 line or less. Segments oblanceolate, 2–3 lines.
      - Stamens shortly diadelphous . . . . . 4. *B. paniculata.*
    - Calyx-tube ¼–⅓ in. Segments linear or oval, ⅓–⅜ in. Stamens free . . . . . 5. *B. angolensis.*

Perfect stamens 5, with alternate staminodia, free from the base.
- Stipules lanceolate acute, 1½–2 in. long . . . . . 6. *B. stipulacea.*

1. **B. acuminata,** *Solander; Hook. f. et Benth. Fl. Nigrit.* 326. A tree attaining 20–40 or 60 ft., extremities terete, glabrous or minutely hoary or rusty-puberulous. Leaflets 3–6-jugate, thinly coriaceous, oval- or elliptic-oblong varying to obovate-elliptical, shortly obtusely acuminate or obtuse or subacute, usually more or less rounded at base, glabrous, midrib and lateral nerves prominent, reticulation subprominent beneath; 3–9 in. long, 1 to nearly 5 in. broad; petiolules 1–3 lines. Stipules not apparent. Flowers in terminal simple or usually corymbosely panicled hoary racemes; bracts concave, caducous, ovate or rotundate, 1–3 lines. Pedicels from ¾ in. to 2½ in., in the larger-flowered forms often compressed or 2-edged. Involucral bracteoles thickly or thinly coriaceous, obovate or obovate-oblong, tawny puberulous or tomentose at least externally, from 1–1¾ in. long. Calyx sericeous or glabrate, tube ½–¾ in. long, segments linear or linear-lanceolate, as long or half as long again as the tube. Posterior petal ample, 1½–3 in. long, often pilose on the claw and median portion behind, lamina ½-rotundate, entire or bilobate, flabellately veined, margin usually cristate, 1–3 in. broad, abruptly or cuneately narrowed into the winged channelled claw, which is rhomboid-dilated or more or less bi-auriculate at base. Lateral and anterior petals shorter than or but slightly exceeding the calyx, linear or linear-lanceolate, variously dilated or auricled below. Stamens all perfect, elongate, posterior one free, rest very shortly connate at base. Ovary shortly stipitate, tomentose or pilose; style elongate (or short, perhaps a sexual difference), glabrous except below; stigma capitellate. Ovules 6–8. Legume 9 in. to 1 ft. long,

2 in. broad, flat, with the ventral suture thickened and laterally ridged; valves rugulose, tawny. Stipes very oblique, thick, 1 in. long.—*Adansonia*, vi. t. 3, fig. 10.

Upper Guinea. Sierra Leone, *Smeathmann!* Bassa Cove, *Ansell!* Camaroons river, *Mann!* Old Calabar, *Mann! W. C. Thomson!* Gaboon, *Griffon du Bellay.*

Mozamb. Distr. Rovuma river, *Dr. Kirk!* The specimen, however, is mounted along with the legume of an *Afzelia*, so that it is possible there may have been transposition of labels.

Var. *Heudelotiana* (Baillon in Adans. vi. 185, t. 3, figs. 8, 9.) Flowers smaller, about 1½ in. in length. Bracteoles thinner, sericeous throughout internally. Calyx nearly glabrous. (Style short, circinate in our specimens.)

Senegambia, *Heudelot!* Mr. Barter sent the same variety, but with larger flowers, from the Niger Expedition, the name of the locality not clear. If the difference in length of the style be constantly associated with the other characters named, M. Baillon's species probably ought to be maintained.

Vahl, in the "Skrivter af Naturhistorie Selskabet" (1802). p. 117, published a genus of Leguminosæ under the name *Westia*, basing it upon two plants (*W. grandiflora* and *W. pariflora*) from Upper Guinea. The description being wholly insufficient to enable one to identify the genus, I applied to Prof. Lange, of Copenhagen, through whose kindness I have been allowed to examine one of Vahl's species—*W. grandiflora* (Guinea, *Isert* coll.) This turns out to be *Berlinia acuminata*, Sol. As *W. pariflora* must be generically distinct, the right course appears to be simply to suppress the genus.

2. **B. auriculata,** *Benth. in Linn. Trans.* xxv. 309. A small glabrous tree, with terete smooth branches. Leaves 2–3-jugate, leaflets thinly coriaceous, elliptic-oblong or the lower smaller leaflets ovate-oblong, obtusely pointed or rather obtusely broadly and usually obliquely acuminate, rounded at base, glabrous, reticulation subprominent, lower 3–5 in., upper from 5–9 in. long, 2–3 in. broad; petioles ¼ in. more or less. Stipules inconspicuous. Flowers in short terminal panicled puberulous racemes, overtopped by the leaves. Bracts small, very early caducous. Pedicels ⅓–½ in. long, slender. Involucral bracteoles thinly coriaceous, oblanceolate-oblong, obtuse, puberulous outside, ⅔–¾ in. long. Calyx glabrous, tube slender, ¼ in. long, segments linear, nearly equal, ciliolate, ½ in. Posterior petal 1½–1¾ in. long, lamina bilobate, 1 in. broad, cuneately narrowed into a long winged claw distinctly auricled at the base; lateral and anterior petals shorter than or equalling the calyx, more or less dilated and abruptly acuminate. Stamens 10, all perfect; filaments filiform elongate, excepting the posterior one very shortly and unequally connate at base. Ovary pubescent-tomentose, shortly stipitate; style long, filiform; stigma capitellate. Ovules about 6. Legume . . . .

Upper Guinea. River Camaroons, *Mann!*

Very nearly allied to *B. acuminata*, var. *Heudelotiana*, more nearly perhaps than is the latter to the large-flowered form of *B. acuminata* with silky calyx and thick involucral bracteoles. The minor characters, however, noted in the claws, with the smaller flowers and relatively longer claw of the posterior petal, distinguish our specimens.

3. **B. bracteosa,** *Benth. in Linn. Trans.* xxv. 309. Tree of 40 ft., flowering branches stout, terete, glabrous, excepting the hoary-puberulous inflorescence. Leaves 4–3-jugate, 1–1½ ft. long; leaflets subopposite or a short distance apart, thinly coriaceous, oblanceolate-

or oval-oblong, shortly and rather obtusely acuminate or broadly pointed, rounded more or less and subequal at the base, glabrous, midrib prominent beneath, reticulation rather prominent above and beneath; 6–8 in. long, 2–3 in. broad on stout petiolules of $\frac{1}{4}$–$\frac{1}{3}$ in. Stipules small. Flowers in terminal stout many-flowered elongating racemes in our specimens $\frac{1}{2}$–$\frac{3}{4}$ ft. long but probably at length twice as long. Bracts coriaceous, oval or oblanceolate hoary-sericeous externally, glabrate within, imbricate and concealing the unexpanded flowers, deciduous on expansion, 2–$2\frac{1}{2}$ in. long. Pedicels stout $\frac{1}{2}$–$\frac{3}{4}$ in. long ascending. Involucral bracteoles at the base of the calyx-tube, oblanceolate-oblong narrowed below, concave, hoary like the bract and pedicel externally, $2\frac{1}{2}$ in. long. Calyx-tube subglabrous, $\frac{1}{2}$ in. long, slightly widening above, limb early deciduous after flowering, segments subequal, linear, acute, reflexed or spreading, exceeding the tube. Petals 5, subequal in length, each with a broad bilobate or emarginate flabellately-veined lamina narrowed rather abruptly into a long winged claw, posterior petal with considerably broader lamina (2–$2\frac{1}{2}$ in.), and proportionately shorter claw ($\frac{3}{4}$–1 in). Stamens all perfect; filaments $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, equalling or exceeding the petals, thinly pubescent below, excepting the posterior one very shortly connate at base. Ovary flat with thickened sutures, closely silky-tomentose, on a gynophore, adnate below, $\frac{1}{3}$–$\frac{1}{2}$ in. beyond the calyx-tube, narrowed above with a slender elongate filiform style equalling the stamens. Ovules 4–6. Legume not seen.

Upper Guinea. Fernando Po, *Mann!*

4. **B. paniculata,** *Benth. in Linn. Trans.* xxv. 311. Spreading tree attaining 30 ft.; extremities and leaves at first shortly and softly hoary-tomentose, at length glabrate. Leaflets 2–4-jugate rigidly coriaceous elliptic-oblong obtuse or shortly and broadly pointed, base oblique, 2–4 in. long; petiolules 1–2 lines. Stipules small, broad, rigid. Racemes simple or compound, short, dense, tawny- or ferruginous-tomentose, collected in branched terminal panicles equalling or shorter than the upper leaves. Bracts caducous orbicular concave 1–2 lines broad. Pedicels 1 line or less. Involucral bracteoles suborbicular concave 6–7 lines long. Calyx-tube shortly turbinate $\frac{1}{2}$ line or less, segments broadly obovate-oblong, usually ciliate, 2–3 lines. Petals but slightly unequal in length, posterior subsessile or shortly clawed, broadly ovate-rotundate concave, often crisped, nearly equalling the rest which are spathulate 4–5 lines long, or lobulate above. Stamens 10 perfect, exserted glabrous, very shortly diadelphous, the posterior filament free from the base. Ovary densely villous-tomentose subsessile; style elongate glabrous above, involute; stigma capitate. Ovules 4–5. Legume very obliquely oblong, 2–3 in. long, 1–$1\frac{1}{4}$ in. broad, densely tomentose at first, at length glabrate nearly smooth.

Lower Guinea. Huilla and (var. *glabrior*) Pungo Andongo, Angola, *Dr. Welwitsch!*

Var.? *ferruginea*, Benth. l. c. Leaves softly tawny-villous. Huilla, *Dr. Welwitsch!* Flowers not seen.

The nervation of the leaflets is curious: the lower half of each has 2 or 3 obliquely ascending nervures from the base, while the upper half is penniveined throughout.

The description of the ripe legume is from Mr. Bentham.

5. **B. angolensis,** *Welwitsch; Benth. in Linn. Trans.* XXV. 310. Tree of moderate size, glabrate excepting the inflorescence and unfolding leaves which are finely puberulous at first. Leaflets 3–4-jugate oval or oval-oblong, the broader obtuse or retuse, narrower acuminate, thinly coriaceous, prominently penniveined beneath, 4–6 in. long, or on sterile branches occasionally 1 ft. or more; petiolules short rigid with the rachis sometimes permanently puberulous. Flowers small in short paniculate or corymbose silky-tomentose tawny or ferruginous racemes, much overtopped by the uppermost leaves. Bracts very early caducous. Pedicels 2 lines or less. Involucral bracteoles oblanceolate concave $\frac{1}{2}$–$\frac{2}{3}$ in. long. Calyx-tube $\frac{1}{4}$–$\frac{1}{3}$ in., narrow glabrous, segments linear or oval-oblong $\frac{1}{3}$–$\frac{1}{2}$ in. long. Petals nearly equal in length, posterior obcordate or obovate-cuneate bifid narrowed below, 6–7 lines long, remainder subsessile, obliquely oval-oblong, plane or undulate. Perfect stamens 10, distinct, filaments exserted, glabrous, or pilose below. Ovary densely villous on a short stipes. Ovules 5–6, occasionally fewer. Legume flat, broadly oblong or slightly narrowed below, thickly coriaceous, obliquely rugose, $\frac{3}{4}$ ft. long.

Lower Guinea. Province of Pungo Andongo, Angola, *Dr. Welwitsch!*

Var. *subcordata* (Welw.) Leaflets broader, elliptic-oblong, rounded or emarginate above, broadly rounded or subcordate at base. Pungo Andongo, *Dr. Welwitsch!*

6. **B. stipulacea,** *Benth. in Linn. Trans.* XXV. 310. Tree of 20–30 ft., excepting the darkly ferrugineo-puberulous inflorescence glabrous. Leaves 4–5-jugate, rachis terete; leaflets coriaceous, oval-oblong or narrowly oblong, terminating in a short hard apiculus, midrib prominent and reticulation subprominent beneath the lateral nervures connected by a broadly-arching intramarginal nerve; 2–8 in. long, 1–2 in. broad; petiolules stout 1–2 lines. Stipules present at flowering, lanceolate acute erect rigid, connate below by their outer margins, $1\frac{1}{2}$–2 in. long. Flowers in terminal panicled corymbose racemes. Bracts deeply concave $\frac{1}{4}$–$\frac{1}{3}$ in. long, early caducous. Pedicels $\frac{3}{4}$ in. Involucral bracteoles coriaceous obovate-oblong obtuse 1–$1\frac{1}{4}$ in. long. Calyx very short glabrous, tube 1–$1\frac{1}{2}$ lines, segments linear acute, slightly dilated at base, $2\frac{1}{2}$–4 lines long. Posterior petal 2–$2\frac{1}{2}$ in., lamina 1–$1\frac{1}{2}$ in. broad, deeply bifid, abruptly cuneately narrowed into the long narrow glabrous claw unappendaged at base; remaining petals $\frac{1}{4}$–$\frac{1}{2}$ in. long, subequal, linear acuminate. Perfect stamens 5, free from the base, filaments filiform, exserted; staminodia alternate with the stamens, subulate shorter than the petals or 0. Ovary densely pilose, subsessile; style elongate, stigma capitate. Ovules 7, more or less. Legume . . .

Upper Guinea. River Muni, *Mann!*

Probably generically distinct.

16. **MACROLOBIUM**, Schreb.; Benth. et Hook. f. Gen. Plant. i. 579.

Buds enclosed between valvate bracteoles until flowering. Calyx-tube very short, turbinate; calyx-limb 4-partite, segments subequal in length, posterior usually broader bifid or emarginate, or 5-partite lobes subequal (in *M. demonstrans*). Posterior petal unguiculate or subsessile, lamina 2-lobed; lateral and anterior petals much smaller or squamiform, or 2 lateral nearly equalling and similar to the posterior. Perfect stamens 3, exserted; filaments free, elongate; anthers oblong or elliptical, dehiscing longitudinally, versatile; staminodia variously abortive or 0 or occasionally subulate and antheriferous. Ovary shortly stipitate or subsessile; style usually filiform, stigma terminal. Ovules 3–10. Legume oblong or broadly oblong oblique, flattened, coriaceous, ventral suture sometimes thickened and grooved; few–several-seeded. Seeds large compressed roundish or quadrate, exalbuminous; cotyledons usually fleshy; radicle short, straight, included.—Unarmed trees or shrubs. Leaves usually 1–6-jugate; stipules foliaceous or inconspicuous. Flowers rather small in simple or compound, solitary or fascicled, contracted or elongate, terminal or axillary racemes. Bracts minute, deciduous. Bracteoles geminate, valvate, enclosing the bud, spreading during flowering.

A considerable genus as circumscribed by Mr. Bentham, chiefly Tropical American. The following species are endemic. Perhaps *Berlinia* ought to be united with *Macrolobium*, but as there remains usually a difference in the number of perfect stamens, so far as species hitherto examined are concerned, the genera may remain until further discoveries enable us to judge how to treat them.

Stipules inconspicuous or 0 at flowering. Calyx-lobes 4, posterior shortly bifid.	
Posterior petal distinctly clawed; 4 smaller petals subequal inter se. Racemes 1–6 in., often fascicled	1. *M. Palisoti.*
Posterior and 2 lateral petals subsimilar, obcordate, subsessile, 2 anterior squamiform. Racemes elongate	2. *M. Heudelotii.*
Stipules of leaves undescribed, of bracts subtending branches of panicle ½ in. Calyx-lobes 5, subequal. Posterior petal distinctly clawed. Panicles ½ ft.	3. *M. demonstrans.*
Stipules present at flowering, sheathing, 2 in. long. Flowers in dense fascicled compound racemes or panicles, 2–3 in. long, from old wood	4. *M. stipulaceum.*

1. **M. Palisoti,** *Benth. in Linn. Trans.* XXV. 308. Tree attaining 30 or 40 ft., extremities glabrous or minutely puberulous. Leaves 2–3–4-jugate, one leaflet of the terminal pair occasionally wanting, rachis 2½–6 in., subterete; leaflets rather coriaceous, 3–8 (9) in. long, 1½–3 (4) in. broad, oblong-elliptical or obovate-elliptical shortly acuminate or apiculate, rounded or broadly cuneate at base, glabrous and shining above, closely and obscurely silvery-sericeous with prominent midrib beneath, lateral nervures rather prominent, subdistant, curving forward; petiolules articulated to rachis, 2–4 lines long; stipules not observed. Flowers usually in short, fascicled, or sometimes solitary,

compound or simple, axillary, rusty-puberulous racemes 1–2 in. in length, occasionally growing out to 4–6 in., pedicels 2–4 lines. Bracts very early caducous. Involucral bracteoles thinly coriaceous, $2\frac{1}{2}$–3 lines long. Calyx deeply 4-fid, tube very short, turbinate, 1 line or less, posterior lobe shortly bifid. Posterior petal obcordate-cuneate or cordate also at the base with a distinct claw, twice as long as the calyx; four smaller petals oval to obovate, often much shorter than calyx-lobes. Perfect stamens 3, exserted, remainder unequal, shorter than calyx, with imperfect or effete anthers. Ovary subsessile pubescent; style slender, glabrous. Ovules 4–5–8. Legume flat, thickly coriaceous, oblong or broadly oblong obtuse at each end, ventral suture thickened with a double laterally prominent margin, valves shortly tawny- or rusty-tomentose, obliquely rugose; 7 in. to 1 ft. long, $1\frac{3}{4}$–$3\frac{1}{2}$ in. broad.—*Anthonotha macrophylla*, P. de Beauv. Fl. Owar. i. 71. t. 42; Adansonia, vi. t. 3. fig. 6 (*Vouapa*).

Upper Guinea. Senegambia (*Vouapa macrophylla*, β. *Heudelotiana*, Baill. in Adans. vi. 179), *Heudelot!* Fernando Po, *Barter! Mann!* Confluence of Quorra and Tschadda, *Barter!* Old Calabar, *W. C. Thomson!* and probably the same, Sierra Leone, *Smeathmann! Don!*

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

M. Baillon, l.c., describes besides, as collected by Heudelot in Senegambia, *Anthonota crassifolia*, sp. nov., differing from *M. Palisoti* in its more coriaceous leaves and very contracted fascicled racemes from the old wood. Probably not distinct. The lateral slender branchlets bearing the short fascicled racemes on their lower nodes, and *apparently* terminating in a single leaf, at first sight strongly suggest their being leaves floriferous in their lower portions. This is well shown in Dr. Welwitsch's magnificent series of this species. (Petal on expansion greenish-white, at length cinnamon-yellow. Dr. W.)

2. **M. Heudelotii,** *Planch.*; *Benth. in Linn. Trans.* xxv. 308. Tall or climbing shrub; branches slender, striate, puberulous. Leaves 3–2-jugate, rachis $2\frac{1}{2}$–4 in. long; leaflets firmly membranous, ovate-elliptical or elliptical, shortly and rather obtusely acuminate, mostly rounded at base, early glabrous, midrib and lateral nerves prominent, reticulation subprominent beneath, $2\frac{1}{2}$–$3\frac{1}{2}$ in. long, $1\frac{1}{2}$–$1\frac{3}{4}$ in. broad; petiolules stout, 1–2 lines. Flowers fascicled at intervals along, or on short lateral branches of, slender elongate leafless puberulous racemes; pedicels 2–3 lines. Bracts minute caducous. Involucral bracteoles $\frac{1}{4}$ in. long, elliptical, obtuse, concave. Calyx-tube very short, lobes of limb thin, ovate or ovate-lanceolate, the posterior broader and minutely bifid. Posterior and 2 lateral petals subequal, slightly exceeding calyx, bilobate, subsessile or very shortly clawed; 2 anterior petals minute, squamiform. Fertile stamens 3, elongate, glabrous; rest minute, abortive. Ovary tomentose, subsessile; style short, incurved, glabrous. Ovules 3–4. Legume 2–4 in. long, oblique, broad, thickly coriaceous, tomentose or villous, obliquely rugose, ventral suture thickened with a double raised line.—*Vouapa* (*Triplisomeris*) *explicans*, Baill. in Adans. vi. 181.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot!* Rio Nunez, *Whitfield!*

3. **M. demonstrans.** Climbing shrub; branches stout, rugose, striate. Leaves 3-jugate, leaflets coriaceous oblong, shortly acuminate, unequally rounded and subauricled on the outer edge at base, smooth and shining above, opaque and ferruginous beneath with prominent midrib and venation; reaching 8 in. in length by 3–3½ in. in breadth. Racemes axillary, branched and paniculate, 6 in. long. Bracts subtending the branches of inflorescence apparently obsolete or caducous, their stipules lanceolate glabrous ½–¾ in. long. Involucral bracteoles ovate-lanceolate, thickly coriaceous, puberulous. Calyx-lobes 5, subequal, membranous, oblong, acute, glabrous, slightly exceeding the 4 smaller petals. Posterior petal ample, limb 2-lobate, claw long and stout. Fertile stamens 3, exserted, rest gland-like or 0. Ovary shortly stipitate, rusty-villous, 4-ovulate; style slender, glabrous; stigma capitellate. Legume . . . . *Vouapa* (*Pentisomeris*) *demonstrans*, Baill. in Adans. vi. 180, t. 3, figs. 1–5.

Upper Guinea. Gaboon, *Duparquet and Griffon du Bellay.*
Description from Baillon. I have not seen specimens.

4. **M. stipulaceum,** *Benth. in Linn. Trans.* xxv. 308. Small tree; ultimate branches rather stout, appressed-pubescent or tomentose at first, closely invested by the sheathing stipules which considerably exceed the internodes. Leaves ample, 3–6-jugate, rachis terete, finely tomentose or glabrate; leaflets submembranous or thinly coriaceous, oval-oblong, finely rather abruptly acuminate, cuneate or rounded at the base, glabrous above, more or less silvery with closely appressed minute silky hairs beneath, midrib prominent; lower leaflets 2½–4 in., upper 6–12 in. long with the acumen of ½–¾ in., 1½–3 in. broad. Stipules subcoriaceous, ample, acuminate, connate by their inner margins, loosely sheathing the stem, 2–2½ in. long, longitudinally nerved. Flowers in small dense many-flowered fascicled rusty-puberulous compound racemes or panicles, 2–3 in. long and broad, from the wood of a previous year. Bracts present at flowering, cymbiform, 2 lines long. Pedicels slender, ½–¾ in. Involucral bracteoles obovate obtuse, tomentose externally, ⅓–½ in. long, nearly or quite equalling the flower. Calyx deeply 4-fid, lobes ovate, scarcely acute, posterior lobe bidentate or emarginate, tube turbinate, 1 line. Posterior petal with a broad 2-lobed lamina, equalling the claw the margins of which are incurved; 4 smaller petals entire. Perfect stamens 3, filaments elongate; anthers elliptic-oblong, versatile, remainder very minute or suppressed. Ovary subsessile, pilose; style elongate, recurved, pilose below; stigma capitate. Ovules 7-8. Legume not seen.

Upper Guinea. River Gaboon, *Mann!*

17. **DANIELLIA,** Bennett; Benth. et Hook. f. Gen. Plant. i. 580.

Calyx-tube narrowly funnel-shaped, limb 4-partite, segments nearly equal, broadly imbricate, deciduous. Petals 5, the lateral and anterior very minute and evanescent, the posterior only usually apparent at

flowering, oblong, entire, sessile, shorter than the calyx. Stamens 10, free, all perfect, filaments elongate, glabrous, anthers versatile, oblong, dehiscing longitudinally. Ovary raised upon a gynophore of its own length, glabrous, narrowed above into the slender elongate style; stigma terminal. Ovules 12–16, biseriate, inserted at and above the middle of the cavity. Legume stipitate, flat, coriaceous, smooth, glabrous, 2-valved, the endocarp rolling up when mature; usually 1-seeded. Seed suspended by a funicle dilated at the hilum; "exalbuminous. Cotyledons flat; radicle short, straight."—A large resin-affording unarmed glabrous tree. Leaves abruptly pinnate. Stipules . . . . Flowers in terminal panicled racemes. Bracts and bracteoles caducous.

Based upon the following species, which are confined to Western Africa.

Leaflets usually ovate-elliptical or lanceolate. Calyx-tube narrowly funnel-shaped. Filaments glabrous . . . . . 1. *D. thurifera.*
Leaflets oblong. Calyx-tube pyriform. Filaments tomentose . . 2. *D. oblonga.*

1. **D. thurifera,** *Bennett in Pharm. Journ.* xiv. (1855) 252. A large tree from 50–150 ft. in height, wholly glabrous; the extremities marked with annular scars, apparently of broad-based caducous stipules. Leaves abruptly pinnate, varying from 4 or 6 in. to 1½ ft.; leaflets in 5–8 pairs, coriaceous and shining above, ovate-elliptical to ovate-lanceolate or oblong obtusely apiculate or shortly acuminate, base usually broadly and very obliquely rounded, reticulation rather prominent, more or less distinctly translucent-punctate; 2–7 in. long; petiolule 2–5 lines. Flowers white or tinged with violet, in terminal many-flowered glabrous often glaucous panicles consisting of numerous alternate racemes successively spreading or decurved from a common axis. Bracts very early caducous, obovate or oblong, ¼–⅓ in. long; bracteoles geminate, elliptical or obovate, thinly coriaceous, ⅓ in. long, falling long before expansion. Calyx-tube narrowly funnel-shaped, narrowed into the pedicel of ⅙–½ in., segments obovate- or oval-oblong ½ in. long. Posterior petal only usually noticeable at flowering, oblong, entire, dotted with immersed glands, shorter than the calyx-lobes. Filaments filiform, glabrous, exserted. Ovary glabrous on a gynophore of about its own length, narrowed above into the style. Legume usually 1-seeded, obliquely obovate, the ventral suture much rounded, dorsal nearly straight, 2–2½ in. long, 1–1½ in. broad. Seed compressed, dark-coloured, ¾ in. long, ½–⅔ in. broad; funiculus ¼–½ in.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Dr. Daniell, M. L. Melville!* Niger Expedition, *Barter!* Fernando Po, *Mann!*

The Frankincense Tree of Sierra Leone, called *Bumbo, Bungbo,* or *Bungo* by the natives, or *Thiévi* in Senegambia; or, according to Mr. Bennett, l.c., the above names of the Leonese are applied to the fragrant resin exuded by the tree.

2. **D. oblonga,** *Oliv.* Of this species we have not material for a complete description, but our fragmentary specimen from Barter suffices to establish specific distinction. Leaflets narrower than in *D. thurifera,* oblong, shortly acuminate, base very oblique, glabrous, shining and

reticulate above, translucent-punctate with rounded and oval glands, 3–4½ in. long, 1⅙–1½ in. broad; petiolule ⅙–⅓ in. Calyx-tube shorter than in *D. thurifera*, pyriform, from insertion of the bracteoles to base of segments 4 lines. Filaments densely silky-tomentose.

Upper Guinea. Fernando Po, *Barter!*

Mr. Barter describes it as attaining nearly 200 ft. in height. "Flowers pale blue." I think the *Daniellia* referred to by Mr. Bennett (Pharm. Journ. xiv. 1855, 252) as collected by Afzelius, characterized by an obconical calyx-tube and silky filaments, may be the same species, but the flowers on the specimens contained in the Herbarium of the British Museum are detached, and I find the same form of flower associated with both forms of leaflet. Either therefore there has been some misidentification, or the forms here distinguished belong to one species.

18. **AFZELIA,** Smith; Benth. et Hook. f. Gen. Plant. i. 580.

§ Euafzelia.

Calyx-tube narrowly infundibuliform or cylindrical, limb 4-partite, segments entire, subequal or inner pair slightly longer, imbricate. Vexillum exceeding (sometimes many times) the calyx, clawed, lamina bilobate or subentire; lateral and anterior petals minute squamiform or 0. Perfect stamens 7, filaments elongate, very shortly coherent at the base; anthers versatile, oblong, dehiscing longitudinally; staminodia 2, subulate or filiform, one at each side of the vexillum; posterior stamen 0. Ovary shortly stipitate, narrowed above into the slender style; ovules 8–10 or more. Legume oblong elliptic- or obovate-oblong, 2-valved, several-seeded; valves thick, woody, smooth or nearly so externally, with transverse cellular or spongy septa internally separating the seeds. Seeds (in well-ascertained species) large, oblong or ellipsoidal, smooth, black, with a large cupuliform closely investing scarlet or yellow arillus investing the lower third.—Unarmed trees. Leaves abruptly pinnate. Stipules not observed. Flowers in terminal simple or panicled racemes. Bracteoles inserted on the pedicel at the base of the calyx-tube, shorter than the bud, caducous or falling by the time of expansion.

The following species are confined to Africa:—

Bracts ¼–⅓ in., deciduous but little before or at flowering, reflexed. Vexillum 4–5 times as long as calyx . . . . . 1. *A. bracteata.*

Bracts 1–2 lines, very early caducous. Vexillum 2–3 times as long as calyx.

Leaflets usually apiculate. Racemes panicled. Calyx-segments not ½ in. . . . . 2. *A. africana.*

Leaflets emarginate. Racemes usually simple. Calyx-segments ½–¾ in. . . . . 3. *A. cuanzensis.*

1. **A. bracteata,** *T. Vogel in Fl. Nigrit.* 325, t. 34–35. Tree of medium size; extremities terete, glabrous or at first minutely puberulous. Leaflets 3–5-jugate, thinly coriaceous, glabrous, shining, with subprominent reticulation above, paler or subglaucous beneath, oval-oblong, narrowly elliptical or obovate-oblong, obtuse often minutely emarginate, occasionally broadly and obtusely pointed, entire or obscurely undulate, 2–4½ in. long, 1–1½ in. broad; petiolule 1–1½ lines. Flowers (scarlet and fragrant according to Heudelot) in terminal simple or pani-

cled hoary-puberulous racemes. Bracts deciduous a little before or at the time of flowering, broadly ovate or obovate, reflexed, $\frac{1}{4}$–$\frac{1}{3}$ in. long. Pedicels $\frac{1}{6}$–$\frac{2}{3}$ in. long; bracteoles geminate, elliptical, hoary at length, reflexed and deciduous at or before flowering, $\frac{1}{4}$ in. long or less, about half as long as the calyx-tube. Calyx puberulous, tube cylindrical at length, slightly longer than the subequal obovate or broadly elliptical obtuse segments of the 4-partite limb. Posterior petal with a linear claw $\frac{3}{4}$–$1\frac{1}{4}$ in. long, lamina deeply bifid, $\frac{3}{4}$–1 in. broad, each lobe rounded or subreniform; remaining petals 0 (or early evanescent). Perfect stamens 7, filaments filiform, pilose more or less, and very shortly coherent at the base; staminodia 2, filiform or subulate, one on each side of the base of the vexillum; posterior stamen 0. Ovary on a short gynophore, compressed, narrowed into the slender style; stigma subcapitate. Ovules 10 or more, uniseriate. I have not seen authentic specimens of the legume.

Upper Guinea. Sierra Leone, *Smeathmann! T. Vogel!* Senegambia, *Heudelot!* Bagroo river, *Mann!*

2. **A. africana,** *Smith; DC. Prod.* ii. 507. A large glabrous tree; extremities terete. Leaves often 1 ft. or more in length; leaflets 4–5-jugate, elliptical or elliptic-oblong, shortly acuminate, obtusely apiculate or rounded at the apex, usually broadly rounded at the base, thinly coriaceous or submembranous, obscurely undulate-crenulate or entire, shining and reticulate above, paler or subglaucous beneath, $2\frac{1}{2}$–5 in. long, $1\frac{1}{2}$–$2\frac{3}{4}$ in. broad; petiolules $\frac{1}{4}$–$\frac{1}{3}$ in. Flowers hoary-puberulous, in terminal panicled short lax or dense racemes. Bracts very early caducous, ovate or rotundate, 1–2 lines long. Pedicels $\frac{1}{4}$–$\frac{1}{2}$ in.; bracteoles caducous, $\frac{1}{4}$ in. long. Calyx-tube narrowly funnel-shaped, shorter than or at length nearly equalling the obovate or broadly elliptical segments of the limb. Vexillum $\frac{1}{2}$–$\frac{3}{4}$ in. long, broadly clawed, about twice as long as the calyx-lobes, pilose at least on the claw. Stamens, staminodes, and pistil as in *A. bracteata.* Ovules about 10. "Legume oblong or ovate-oblong, suboblique, with a short lateral acumen. Valves very thick, glabrous externally."—Fl. Seneg. i. 263, t. 57.

Upper Guinea. Senegambia, *Heudelot! Perrottet!* Nupe, Niger, *Barter!*
Lower Guinea. Congo, *Smith!*
Barter describes the flowers as "white and red, very fragrant." The only fruits of *Afzelia* sent home by Mr. Barter are not attached to the flowering specimens, by number or otherwise, and so cannot be certainly identified. They are broadly and obliquely oblong, 6–7 in. long, 2–$2\frac{3}{4}$ in. broad, and nearly 1 in. in thickness, 10–12 seeded; the valves are thick, woody, perfectly glabrous, and minutely punctate or shagreened externally.

3. **A. cuanzensis,** *Welw. Apont. Phyto-geogr.* No. 35. Tree, varying from 15–30 ft. and upwards; annual shoots shortly and very finely pubescent, early glabrous. Leaves glabrous, 5–18 in. long; leaflets 4–7-jugate, firmly membranous to coriaceous, elliptical or oblong-elliptical, occasionally obovate- or ovate-elliptical obtuse and emarginate, rounded or broadly cuneate at base, entire or obscurely undulate-crenulate, shining and reticulate above, subglaucous or paler beneath, $1\frac{1}{2}$–4 in.

long, ¾–2½ in. broad, on petiolules of 1–5 lines. Flowers larger than in *A. africana*, in terminal simple solitary hoary or pubescent racemes not exceeding 3–4 in. in length in our specimens, the racemes occasionally forked at the base. Bracts concave, caducous, 1–3 lines long; bracteoles caducous, ¼ in. or less. Calyx-tube narrowly funnel-shaped or subcylindrical, about equalling the inner and longer obovate concave segments of the limb. Vexillum ¾–1¼ in. long, 2–3 times as long as the calyx, clawed, the claw channelled, either very narrow at the base dilating upwards into the bilobate blood-red lamina or broader and cuneately expanded above, sometimes thinly pilose dorsally. Lateral and anterior petals very minute squamiform. Fertile stamens 7 (–9) and staminodia as in *A. bracteata*; filaments very shortly connate at the base, glabrous, or thinly pilose. Ovary on a gynophore of about its own length, thinly pubescent on the margin or glabrous, narrowed into the elongate slender style. Ovules uniseriate, about 10. Legume oblong, smooth, punctate, glabrous, shortly and obliquely apiculate, rounded and gibbous at the base, 5–7 in. long, 1¾–2½ in. broad.—*A. Petersiana*, Klotzsch in Peters' Mossamb. Bot. 19.

Lower Guinea. Golungo Alto and Pungo Andongo, Angola, *Dr. Welwitsch!*
South Central. Highlands of Batoka country, *Dr. Kirk!*
Mozamb. Distr. Zanzibar, Usekhe, *Speke and Grant!* (A form with more coriaceous leaflets and broadly clawed petal); common on the Zambesi, *Dr. Kirk!* West shore of Nyassa, *Dr. Kirk!*

Also south of the Tropic at Delagoa Bay, *Forbes!*

Specimens of an *Afzelia*, probably specifically distinct, in fruit only, with unfolding leaves and young buds are in the Kew Herbarium, collected by Dr. Kirk on the Rovuma. It differs from the Zambesi plant in its smaller growth and larger flowers, according to Dr. Kirk. The leaflets also appear longer and more ovate. The legumes are very thick and woody, about 6 in. long, 2½ in. broad, 8–9 seeded, broadly oblong or elliptic-oblong, rounded and gibbous at the base, projecting upon the oblique insertion of the stout peduncle. *Afzelia attenuata*, Klotzsch, also described in the work cited from very fragmentary specimens, cannot be certainly identified. An authentic specimen, however, kindly lent by the Berlin Museum for comparison at Kew, agreed, so far as it went, with the above.*

With our specimens of *Afzelia* are sorted away specimens, in leaf and fruit only, of a leguminous tree or shrub from the Batoka country (*Dr. Kirk*), which may or may not belong to the genus. The young extremities and rachis of the leaves more or less tawny-pubescent, or pilose-tomentose; leaflets in 3–4 pairs, very coriaceous, elliptic-oblong, obtuse, or emarginate, finely reticulate, at length glabrescent, sparingly pubescent on midrib beneath, 2–2½ in. long. Legume flat, obliquely and narrowly obovate-cuneate or oblanceolate-cuneate, 3–5 in. long, 1½–2 in. broad near the extremity, narrowed with but slightly curved sides to the obtuse base; valves clothed with a deciduous, patchy, ferruginous tomentum. Seeds few, compressed, elliptical, smooth, dark-brown, 1 in. long, exarillate, exalbuminous. In the Herbarium of the British Museum are insufficient specimens of perhaps 2 species from Sierra Leone, probably belonging to this genus.

19. **CRYPTOSEPALUM**, Benth.; Benth. et Hook. f. Gen. Plant. i. 584.

Flowers small, buds enclosed between a pair of valvate bracteoles. Calyx-tube minute, turbinate or urceolate, limb of 3–4–5 minute often

* *Afzelia? Pancovia*, DC. Prod. ii. 507 (*Pancovia bijuga*, Willd.), M. Baillon informs me is a Sapindacea.

unequal teeth, 1 lobe sometimes petaloid. Petal 1, posterior, elliptical obovate or orbicular, sessile. Stamens 3, distinct, filaments short subulate-filiform, all perfect or one anantherous; anthers elliptical, versatile, unappendaged, dehiscing longitudinally. Ovary shortly stipitate, compressed, 2–4-ovulate, ventral suture somewhat thickened or channelled; style involute, shorter than or equalling the ovary; stigma capitate. Legume unknown.—Small unarmed trees or shrubs; branch-buds protected by imbricating scarious squamæ. Leaves abruptly pinnate. Stipules subulate or inconspicuous, caducous. Flowers in axillary or terminal simple racemes; involucral bracteoles spreading at flowering.

Confined to Tropical Africa. The two new species differ much in aspect from the original species upon which the genus was based by Mr. Bentham, but the floral structure is almost identical. Their affinity may prove to be with *Brachystegia*, from which the number of stamens seems for the present to distinguish them. As the fruit of *Cryptosepalum* is unknown, the time for satisfactory consolidation has not yet come.

Leaflets usually 2-jugate, upper larger. Racemes axillary.	
Ovules 2	1. *C. tetraphyllum.*
Leaflets 6–7-jugate. Racemes terminal. Ovules 4	2. *C. maraviense.*
Leaflets 15–25-jugate. Racemes or corymbs terminal. Ovules 2	3. *C. mimosoides.*

1. **C. tetraphyllum,** *Benth. in Linn. Trans.* xxv. 315, t. 43, B. A small much-branched tree; the extremities minutely puberulous, glabrescent; leaflets 2-jugate or sometimes 1-jugate, rather coriaceous, very obliquely ovate or ovate-lanceolate or even subfalcate, obtusely pointed, the leaflets of the upper pair usually much larger than the lower which are not strictly opposite, glabrous or very nearly so, excepting sometimes upon the midrib beneath, veiny below; upper leaflets 1–1½ in. or larger on flowerless branches. Racemes axillary, shorter than the leaves. Bracts very early caducous; involucral bracteoles elliptical, subacute, under 2 lines long. Calyx-tube ½ line, urceolate; segments 4 ovate, ¼–½ line long. Petal orbicular. Ovary glabrous, biovulate. Legume . . . .—*Cynometra? tetraphylla,* Hook. f. Fl. Nigrit. 329.

Upper Guinea. Sierra Leone, *Don! Barter!*

2. **C. maraviense,** *Oliv.* Extremities slender, shortly and thinly pubescent. Leaves about 3 in. long; leaflets sessile or subsessile, in 6–7 pairs, oblong-lanceolate or obliquely-oblong, usually slightly narrowed to the obtuse apex, base rounded, oblique, very thinly pubescent or glabrate and veiny above, paler or thinly pubescent beneath, ¾–1 in. long. Stipules apparently minute caducous. Flowers in terminal simple racemes of 1½–2 in. Bracts minute, membranous, lanceolate; involucral bracteoles elliptical, broadly pointed, thinly pubescent externally, 2 lines long. Pedicels equalling the flowers, slender. Calyx-tube turbinate, ½ line or less, lobes at length obsolete, unequal, subulate or deltoid-lanceolate, ¼–⅓ line or one petaloid. Posterior petal rotundate or obovate, about equalling the bracteoles. Ovary below and on dorsal suture pubescent, 4-ovulate. Legume . . . .

Mozamb. Distr. Maravi country, west of Lake Nyassa, *Dr. Kirk!*

3. **C.? mimosoides,** *Welw.* A low shrub, with a stout decumbent root-stock, giving off erect or ascending leafy branches from a span to 1 ft. in height; branches minutely pubescent or glabrate, slender, rather rigid. Leaves $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, distichous; leaflets in 14–25 pairs at intervals of 1–2 lines, oblong or linear often slightly falcate obtuse or broadly obliquely pointed, rather coriaceous, nervose, glabrous or glabrescent, sessile, $\frac{1}{4}$ to over $\frac{1}{2}$ in. in length; rachis puberulous or glabrous. Flowers (very sparingly produced, only seen in one specimen), 4 or 5 together at the extremity of a leafy branch. Pedicels about 1 line. Involucral bracteoles thin, 2 lines long. Calyx-tube turbinate, glabrous, $\frac{1}{2}$ line long, with 3 or 4 minute teeth. Petal elliptical, concave, three times as long as the calyx. Perfect stamens 2, 1 with an apparently effete anther. Ovary compressed, glabrous except on the sutures, on a short pilose stipes; ovules 2. Legume . . . .

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*

Specimens in leaf only, probably of a fourth species, allied to *C. mimosoides*, were gathered in Pungo Andongo by Dr. Welwitsch. In habit it is similar, but attaining 20–30 in. Leaflets in 18–24 pairs, oblong lanceolate obtuse, with the midrib widely eccentric immediately within the upper margin, $\frac{1}{2}$–$1\frac{1}{2}$ in. in length. Stipules subulate or filiform, erect, $\frac{1}{4}$–1 in. long, caducous.

20. **BRACHYSTEGIA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 582.

Flowers enclosed in bud between a pair of sepal-like valvate bracteoles. Perianth reduced to 2 or more (5–7) minute oblong linear or subulate scales, usually not exceeding 1–2 lines in length. Stamens 10–13; filaments slender, more or less distinctly connate at base; anthers ovate or elliptical, versatile, dehiscing longitudinally. Ovary subsessile or stipitate, 5–8-ovulate; style elongate, slender; stigma terminal, obtuse. Legume oblong, usually at right angles to its short stipes, compressed, ventral suture often slightly dilated, 2-valved; valves coriaceous or woody, at length smooth. Seeds "few, transverse, compressed, exalbuminous; cotyledons flat, with a short straight included radicle."—Trees, unarmed. Leaves abruptly pinnate. Flowers rather small in terminal simple spicate dense racemes or axillary paniculate confluent glomerules. Bracts caducous; bracteoles present at flowering, valvate over the bud.

Confined to Tropical Africa.

Leaflets usually in 3–6 pairs.
- Leaflets pointed or acuminate, glabrous. Pedicels 2–3 lines . 1. *B. appendiculata.*
- Leaflets obtuse or broadly pointed. Pedicels 0–1 line . . . 2. *B. spicæformis.*

Leaflets in 10–20 pairs . . . . . 3. *B. tamarindoides.*

1. **B. appendiculata,** *Benth. in Linn. Trans.* xxv. 313, t. 42. Tree of 20–40 ft., wholly glabrous, or the inflorescence often puberulous; extremities slender, divaricately branched. Leaflets usually in 4 pairs, membranous or thinly coriaceous, shining and venose, varying from oval or lanceolate to oblong-elliptical, often gradually obtusely acuminate or broadly pointed obtuse or minutely emarginate, base unequal,

narrowed or obtuse, midrib slightly eccentric; 1–2 in. long, $\frac{1}{3}$–$\frac{3}{4}$ in. broad, the upper usually the larger, subsessile, or the upper margin of the lamina $\frac{1}{2}$–1 line above the lower; common petiole slender $\frac{1}{2}$–1 in. between each pair of leaflets bearing at the insertion of each a pair of small glands. Flowers "greenish-white," in very dense, terminal, simple, or slightly branched racemes 1–3 in. long. Bracts very early caducous, very small, linear (Mr. Bentham). Involucral bracteoles 3–4 lines long, thin, elliptical or obovate, pubescent outside, spreading at flowering. Perianth reduced to 2 (or 3) minute, narrow-linear or -spathulate ciliolate unequal scales, 1 line long or less. Staminal tube shorter than the stipes of the pilose ovary. Style elongate glabrous. Ovules 5–6. Legume 2-valved, oblong, $3\frac{1}{2}$–$4\frac{1}{2}$ in. long, 1–$1\frac{1}{2}$ in. broad; valves thin but very hard and woody, smooth and glabrous externally. Seeds compressed, elliptical or obovate, $\frac{1}{2}$–$\frac{3}{4}$ in. long.

South Central. Highlands of Batoka country, *Dr. Kirk!*
Mozamb. Distr. Near Lake Shirwa, *Dr. Meller!*
The seeds are eaten, and the fibrous bark beaten out into a substitute for cloth by the natives. (*Dr. Kirk.*)

2. **B. spicæformis,** *Benth. in Linn. Trans.* XXV. 312. A tree of 20–40 ft. or higher; leafy shoots pubescent, at length glabrate. Leaflets thinly coriaceous, usually in 4–6 pairs, more rarely 2–3-jugate, ovate-elliptical or varying to oval-oblong obtuse often minutely emarginate or shortly and obtusely pointed, base unequally rounded, penni-veined with rather prominent reticulation, or in some luxuriant leaves the lower half of the leaflet with 3 or 4 ascending secondary nervures from the base, minutely pubescent or glabrate; 1–$1\frac{1}{2}$ or occasionally over 2 in. in length; petiolule distinct but very short, with a glandular or stipelliform dilatation at the base. Stipules linear, membranous, early deciduous. Flowers subsessile in terminal, simple, very dense, ferruginous, spiciform, ovoid or oblong-ovoid racemes 1 or 2 in. long, much exceeded by the leaves. Bracts linear to obovate-oblong 2–3 lines long, deciduous. Involucral bracteoles obovate or elliptical $\frac{1}{4}$–$\frac{1}{3}$ in. long. Perianth usually reduced to 2 linear or lanceolate ciliate scales about 1 line in length, alternating with the bracteoles; occasionally a few additional minute scales are present. Stamens 10–13, unequally and distinctly monadelphous, glabrous. Ovary laxly or substrigose-pilose on a stipes of its own length; ovules 7–8. Legume at right angles to the short stout stipes, broadly more or less oblong, ventral suture slightly thickened, terminating in a short, straight, pungent apiculus; valves thickly woody-coriaceous, at length smooth, 3–$4\frac{1}{2}$ in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!* Var. *grandiflora,* Benth. l.c. Bracts linear or oblong channelled. Bracteoles oblanceolate, puberulous externally, $\frac{1}{2}$ in. long. Pedicels about 1 line. Sierra da Hella, Huilla, *Dr. Welwitsch!*
Mozamb. Distr. Robeho mountains, Zanzibar, *Speke and Grant!*
Speke and Grant remark that the bark is employed in various fabrics by the natives, and that a red juice exudes on cutting it.

3. **B. tamarindoides,** *Welw.*; *Benth. in Linn. Trans.* XXV. 312. Much branched tree of 15–40 ft. in height; extremities pubescent, at length glabrous. Leaflets in 10–18 pairs, at intervals of 2–3 lines, sessile, coriaceous, obliquely oblong-lanceolate obtuse, the somewhat eccentric midrib often terminating in a minute mucro, base unequal, shortly pubescent or tomentose-pubescent or at length subglabrate, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Flowers subsessile, in short, dense, ferruginous racemes or glomerules in the upper axils, or more or less confluent in terminal oblong panicles of 1 or 2 in. scarcely overtopping the leaves. Bracts ovate concave 1–$1\frac{1}{2}$ lines long. Involucral bracteoles rotundate, concave, about 2 lines long. Perianth reduced to about 5 obovate or oblong-ciliate scales, 1 line or less in length. Stamens 10, glabrous, filaments connate in a very short ring at base. Ovary subsessile, densely villous; ovules about 7. Legume oblong or from lanceolate to oblanceolate-oblong at right angles to the short stout gynophore of $\frac{1}{6}$–$\frac{1}{4}$ in., the ventral suture dilated and terminating in the more or less persistent, rigid, subulate, straight base of the style; valves thickly coriaceous, at length smooth; 3–$3\frac{1}{2}$ in. long, 1–$1\frac{1}{4}$ in. broad.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

To the same or a nearly allied species must be referred fruiting specimens collected by Dr. Welwitsch in Pungo Andongo (and—a leaf only—by Speke and Grant on their way to the Victoria Nyanza), of which the leaves are $\frac{1}{2}$–1 ft. in length, and the leaflets $1\frac{1}{4}$–2 in. The legume does not materially differ.

21. DIDELOTIA, Baill.; Benth. et Hook. f. Gen. Plant. i. 1003.

Flowers small, enclosed until expansion between a pair of concave valvate bracteoles. Calyx and corolla obsolete or reduced to subulate rudiments. Stamens 5, subequal, antheriferous; filaments filiform; anthers small, ovate or elliptical, dehiscing longitudinally. Ovary subsessile; style filiform, stigma minute; ovules indefinite, biseriate. Legume undescribed.—Leaves shortly petiolate, bifoliolate, leaflets subcoriaceous, glabrous, obliquely ovate-oblong or -lanceolate acuminate 1-nerved. Flowers small in short dense racemes given off successively from an elongate, slender, leafless rachis.

Based upon the following species peculiar to West Tropical Africa. It may prove congeneric with *Brachystegia.*

1. **D. africana,** *Baill. in Adans.* v. 367 (*note*), t. 8. Outer margin of sessile leaflets at base broadly rounded, inner cuneate; 4–5 in. long, 2 in. broad; petiole $\frac{1}{4}$–$\frac{1}{3}$ in. long. Racemes pedunculate, cylindrical or ovoid, arranged alternately in slender compound racemes of 8 in.

Upper Guinea. Gaboon, *Griffon du Bellay.*

I have not seen a specimen. The description is from M. Baillon's Memoir.

22. TAMARINDUS, Linn.; Benth. et Hook. f. Gen. Plant. i. 581.

Calyx-tube narrowly funnel-shaped, limb 4-partite, segments subequal in length, entire, imbricate, submembranous. Petals 3 (1 pos-

terior, 2 lateral), oblong or obovate-oblong, subequal, equal to or but slightly exceeding the calyx, narrowed to the base or shortly clawed; 2 anterior petals minute, subulate or squamiform. Fertile stamens 3, anterior connate nearly half their length, alternating with minute or rudimentary staminodia; anthers oblong, versatile. Ovary stipitate; style rather stout equalling the stamens; stigma terminal, obtuse, slightly thickened; ovules 8–10 or more. Legume oblong or linear-oblong, curved, or nearly straight, subterete, or compressed; outer layer of pericarp thin, crustaceous; inner pulpy traversed by fibres. Seeds obovate-elliptical or roundish, compressed, with a thick, shining testa, each side marked with a large faintly defined areole; albumen 0. —Large unarmed forest-tree. Leaves abruptly pinnate, leaflets small, coriaceous, oblong, obtuse, reticulate, subsessile, multi-jugate, usually in 9–17–21 pairs. Stipules linear, early caducous. Flowers yellowish or red-striped in simple or panicled racemes, terminal or lateral; bracts concave caducous; bracteoles valvate enclosing the early bud, caducous.

The Tamarind, the only species of the genus, valued on account of the acid pulp of the fruit, would appear to be truly indigenous in Tropical Africa. It is widely diffused, however, either under cultivation or naturalized, through the Tropics of both the New and Old World.

1. **T. indica,** *Linn.*; *DC. Prod.* ii. 488. Wholly glabrous or extremities at first thinly pubescent or puberulous, sometimes glaucescent. Leaves $2\frac{1}{2}$–6 in. long; leaflets $\frac{1}{3}$–$1\frac{1}{4}$ in. Bracts concave $\frac{1}{4}$–$\frac{1}{3}$ in. obovate-elliptical, bracteoles pubescent-margined.—Bot. Mag. 4563 (*T. officinalis*, Hook.).

Upper Guinea. Senegambia, Princes Island (cult.?), *Mann!*

Nile Land. Abyssinia, *Dillon and Petit! Schimper!* &c. White Nile, *Dr. Brownell!* Sennaar, *Kotschy!* Kordofan (*Schweinf. et Asch.*).

Lower Guinea. Cazengo, Angola; spontaneous, but possibly introduced, *Dr. Welwitsch!* Subspontaneous or cultivated elsewhere in Angola.

South Central. Batoka country, *Dr. Kirk.*

Mozamb. Distr. Common in Zambesi valley up to the Batoka country, also on the Shire, *Dr. Kirk!* Usagara, *Speke and Grant!*

Dr. Welwitsch collected in Golungo Alto, in a locality where perhaps the Tamarind had been formerly cultivated, specimens of a remarkable monstrosity of this species, the leaflets being reduced to their midrib, excepting a short expansion of the lamina on the lower side at the base. As pointed out to me by Dr. Welwitsch, the seeds appear to be singly enclosed in an arilliform envelope, thinly crustaceous when dry, probably derived from the pulpy endocarp.

23. **BAIKIÆA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 581.

Calyx-tube turbinate; segments linear or oblong elongate, thick, with narrow imbricating abruptly thinner margins. Petals 5, much exceeding the calyx, subequal in length, broadly oblanceolate or obovate-spathulate, narrowed gradually into the long-winged claw, traversed longitudinally by a stout at length evanescent midrib. Stamens 10, upper free, rest connate below; filaments elongate, alternately silky-pilose below; anthers linear-oblong, versatile, each end

recurved, dehiscing longitudinally. Ovary stipitate, densely villous, "style elongate, slender, glabrous;" stigma small; "ovules about 8." Legume unknown.—Unarmed trees, excepting the inflorescence wholly glabrous. Leaves abruptly pinnate, leaflets 2–1-jugate, coriaceous. Flowers very large in very short few-flowered, terminal or subterminal stout racemes; bracts and bracteoles very small, caducous.

Known only from W. Tropical Africa.

Leaflets 2–1 pair, usually 2–4 in. broad. Racemes 1 in., 3–7 flowered. Flowers ½ ft. long	1. *B. insignis.*
Leaflets 3–4 pairs, usually 1½ in. broad or less. Racemes 1½ in., 10–15 flowered. Flowers 3–4 in. long	2. *B. minor.*

1. **B. insignis,** *Benth. in Linn. Trans.* xxv. 314, t. 41. A tree of 30–40 ft.; extremities moderately stout, terete. Leaflets usually in 2 or 1 pair, glabrous, variable in size, very coriaceous, the lateral leaflets often alternate, obliquely elliptical or oblong-elliptical, probably obtusely pointed or acuminate (our numerous leaflets are nearly all eroded towards the apex), midrib prominent beneath, lateral nervures obscure, and venation minutely areolate inconspicuous; 3–4 to 10 in. long, 1½–4 in. broad; petiolules stout, ¼ in. Axis of raceme 1 in. or less, together with the short thick pedicels and oblong or clavate flower-buds clothed with a short, thick, velvety, darkly ferruginous tomentum. Calyx-tube turbinate, stout, ½–¾ in. long; segments at length about 3 in., silky-villous within. Petals 6 in. more or less, externally thinly pilose as is their midrib within, lateral nervures directed forwards. Stamens alternately shorter, the longer nearly equalling the petals; the short sheath villous externally. Stipes of ovary about 1 in. long.

Upper Guinea. Fernando Po, *Mann!*

2. **B. minor,** *Oliv.* Agreeing with *B. insignis* in general characters, differing in the oval-oblong or ovate-lanceolate leaflets in 3–4 pairs, 3–5 in. long, 1½ in. broad, obtusely subacuminate; racemes with more numerous distichous smaller flowers; filaments glabrous. Our specimen is fragmentary.

Lower Guinea. Congo, *Smith! Consul Burton!*

A specimen at the British Museum bears an immature pod, oblanceolate-falcate, about 4½ in. long, 1½ in. broad towards the apex, tipped with the terminal persistent style, and narrowed to the gynophore, which is about 1¼ in. long. The specimen is labelled "*Westia grandiflora*, Vahl?"

24. SCHOTIA, Jacq.; Benth. et Hook. f. Gen. Plant. i. 581.

Calyx-tube turbinate, campanulate, or narrowly infundibuliform; segments 4, much imbricate. Petals 5, slightly unequal clawed or subsessile, longer or shorter than the calyx, imbricate. Stamens 10, free or shortly coherent below; anthers uniform dehiscing longitudinally. Ovary stipitate with elongate style and small terminal stigma; ovules 4–8–10 or more. "Legume oblong, often falcate, compressed, coria-

ceous, dehiscent or subindehiscent. Seeds exalbuminous."—Unarmed trees or shrubs. Leaves abruptly pinnate with coriaceous often small leaflets; stipules small. Flowers red or purple, clustered in short often dense panicles, heads, or racemes. Bracts and bracteoles caducous or subpersistent.

Confined to South extratropical Africa, with the following exceptions :—

Leaflets small. Flowers in dense heads. Calyx-tube campanulate, shorter than the lobes . . . . . 1. *S. capitata.*
Leaflets 4–6 in. Flowers in short dense racemes. Calyx-tube narrow, funnel-shaped, as long as or longer than lobes . . 2. *S. humboldtioides.*

1. **S. capitata,** *Bolle in Peters' Mossamb. Bot.* 18. Glabrous. Leaflets (in 4 or more ? pairs) sessile, coriaceous, obovate-oblong, mucronate or apiculate, narrowed or cuneate at base (in our fragment 3–7 lines long). Flowers numerous in dense heads. Calyx-tube campanulate. Petals obovate distinctly clawed, half as long again as the calyx-lobes. Stamens much exserted, alternately shorter, connate at base. Ovary glabrous, stipitate, stipes adnate to tube of calyx; ovules about 10.

Mozamb. Distr. Inhambane, under the Tropic of Capricorn, *Dr. Peters.*
We have probably the same plant from Delagoa Bay, *Forbes.* M. Baillon, in "Adansonia" (vi. 197), distinguishes a plant from this locality, collected by Forbes, as var. *Forbesiana* of *S. speciosa* (*S. tamarindifolia*, Afz.). Dr. Peters' plant I have not examined.

2. **S. humboldtioides,** *Oliv.* A glabrous tree of 25–30 ft.; extremities (in our specimens) tumid immediately under each node, narrowing gradually nearly to the middle of the internode. Leaves $\frac{1}{2}$–1 ft. long, 2–4-jugate, glabrous; leaflets thinly coriaceous, the lowest pair near the base of the leaf, obliquely elliptic-oblong, or varying from lanceolate- to oblanceolate-oblong, narrowly acuminate, base very oblique rounded; $4\frac{1}{2}$–6 in. long, $1\frac{3}{4}$–$2\frac{1}{3}$ broad; petiolule 0–1 line. Racemes solitary, or 2 or 3 from the axils, $1\frac{1}{2}$–2 in. long, densely many-flowered. Bracteoles broadly ovate, about $\frac{1}{2}$ line long. Flowers patent on pedicels of about 1 line. Calyx $\frac{2}{3}$–$\frac{3}{4}$ in. long, puberulous or glabrate, the tube but slightly exceeding the limb. Petals oval or oblanceolate narrowed at base, slightly longer than calyx-lobes. Filaments glabrous, very shortly unequally coherent at the base. Ovary and gynophore pilose; ovules 4–5. Legume . . . .

Upper Guinea. River Camaroons, *Mann!*
This plant so much resembles species of the Indian genus *Humboldtia*, that in the "Genera Plantarum" it is referred to as an African species of that genus. Excepting in the long narrow calyx-tube and fewer ovules, I do not find any technical character of importance to distinguish it from the other species of *Schotia*. The minute bracteoles, which persist until flowering, do not enclose the young bud.

At Kew there are fragments of perhaps a *Schotia*, in fruit only, from the Batoka highlands. The legumes are 2-valved coriaceous oblong, 2–3 in. long, $\frac{3}{4}$–1 in. broad, the valves tawny-tomentose separating forcibly. **Leaflets apparently in about 4 pairs, 2 in. long, oblong, emarginate.**

25. **TRACHYLOBIUM,** Hayne; Benth. et Hook. f. Gen. Pl. i. 583.

Calyx-tube very short, turbinate, segments 4, subequal, or the two outer slightly shorter, much imbricate. Petals 5, subequal, all clawed with a rotundate or cordate lamina, or the two anterior minute, squamiform. Stamens 10, free or very shortly coherent at base; anthers uniform, oblong, dehiscing longitudinally, versatile. Ovary shortly stipitate, surrounded by a hirsute ring at the base; style slender, glabrous; stigma terminal, small; ovules usually 4–5. Legume oblong, ovoid or obovoid, stout, thickly coriaceous, coarsely verrucose, indehiscent (or tardily dehiscent). Seeds 1 or 2, oblong or ellipsoidal, exalbuminous; the testa thickened internally at 4 equidistant points.—Large unarmed resinous trees. Leaves 2-foliolate; leaflets very oblique, coriaceous, obscurely glandular-punctate. Stipules early caducous or obsolete. Flowers in terminal lax often straggling panicles, white or red. Bracts and bracteoles rotundate, concave, caducous.

Possibly indigenous only in Tropical Africa and the Mascarene Islands, though quasi-spontaneous or cultivated here and there in Tropical Asia and the Archipelago. Very nearly allied to the American genus *Hymenæa*, which differs in the form of the petals and legume.

1. **T. Hornemannianum,** *Hayne, Arzneigewächse*, xi. t. 18. Wholly glabrous excepting the tawny- or silky-pubescent inflorescence; extremities rather stout, terete. Leaflets unijugate, obliquely oblong or elliptical, shortly and obtusely acuminate or apiculate, outer margin at the base broadly rounded to the petiolule 1 or 2 lines below the base of the narrow upper edge, coriaceous, shining, the eccentric midrib prominent beneath, usually from $2\frac{1}{3}$–$3\frac{1}{2}$ (or 4) in. long, 1–$1\frac{1}{2}$ in. broad; petiole $\frac{1}{3}$–1 in. Panicles usually overtopping the leaves, the minutely pubescent sometimes zigzag rachis giving off distichously lateral simple (or compound) racemes. Bracts caducous, concave, orbicular, 1–2 lines broad; bracteoles similar. Pedicels very short, 1–3 lines. Calyx appressed-silky, segments obovate-elliptical or oblong, the inner very slightly longer. Petals posterior and lateral subequal, twice or half as long again as the calyx, lamina rotundate, abruptly or cuneately narrowed into the distinct claw which exceeds the lamina in length; 2 anterior petals squamiform, 1 line or less. Filaments glabrous, very slightly connate at base. Ovules 4 or 5. Legume 1- or 2-seeded, stout, oblong or obovoid, very obtuse, $1\frac{1}{4}$–2 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ in. broad, $\frac{3}{4}$ in. thick, very coarsely resinously warted often with intermediate smaller papillæ. Seeds $\frac{1}{2}$–$\frac{3}{4}$ in. long, thickly oblong.—*T. Gærtnerianum*, Hayne, l. c. t. 19 (no doubt from a garden in Java); *T. mossambicense*, Klotzsch in Peters' Mossamb. Bot. 21, t. 2.

Mozamb. Distr. Zanzibar, *Dr. Kirk!* Rovuma Bay (leaf only), *Dr. Kirk!* Querimba, *Dr. Peters!*

This tree affords part if not all of the Copal of East Tropical Africa. It is very closely allied to *T. verrucosum* (*Hymenæa verrucosa*, Gært. de Fruct. ii. 306, t. 139, fig. 7,) of Madagascar. Almost the only difference which I can discover between the species is in the petals; in *T. verrucosum* the anterior petals nearly equal the rest, and are dis-

tinctly clawed, while in *T. Hornemannianum* they are rudimentary. This character may prove inadequate, in which case the two plants must be reunited under the specific name *verrucosum*, first applied to the Madagascar plant. Hayne, in his original publication of *Trachylobium*, in Flora (1827, ii. 473), describes the petals as 5, subequal; but in his "Arzneigewächse" (xi. t. 18 and 19) gives *T. Gærtnerianum* and *T. Hornemannianum* as tripetalous.

26. **CRUDIA**, Schreb.; Benth. et Hook. f. Gen. Plant. i. 584.

Calyx-tube short, turbinate, segments 4 (–5), thin, broadly imbricate, at length reflexed. Petals 0. Stamens 10 (or fewer), free; filaments filiform, anthers elliptical, versatile, dehiscing longitudinally. Ovary shortly stipitate, narrowed above and below; style slender, stigma small, terminal; ovules few. Legume (not seen in the African species) "obliquely orbicular, ovate or broadly oblong, flat, rigidly coriaceous, 2-valved, often with thickened margins. Seeds 1 or 2, large . . . . exalbuminous."—Unarmed shrubs or trees. Leaves unequally pinnate. Stipules small, caducous or (in following species) rather large subpersistent. Flowers rather small, racemose. Bracts and bracteoles minute, deciduous.

A small genus, chiefly Tropical American, with but 1 species African, and 1 or 2 in the Indian Islands.

1. **C. senegalensis,** *Planch.*; *Benth. in Linn. Trans.* xxv. 314. A shrub or small tree, wholly glabrous. Leaves 4–7-foliolate, leaflets alternate, submembranous or at length coriaceous, elliptic-oblong or varying from ovate to obovate-elliptical, shortly acuminate or apiculate, base slightly unequal, more or less rounded, reticulation subprominent or not conspicuous, 2–4 in. long, 1–2½ in. broad; petiolules 1–2 lines. Stipules erect, rather rigid, venose, ovate-lanceolate or lanceolate acuminate, connate below on the inner margins, ½–1 in. long. Racemes terminal, often on lateral branchlets or extra-axillary, rather laxly many-flowered, 3–6 in. long. Pedicels slender, ¼–¾ in. long. Bracts and bracteoles at base or below the middle of pedicel, minute, deciduous, or bracteoles present at flowering. Calyx-tube very short, turbinate, segments broadly elliptical, subequal, 2–3 lines long. Filaments glabrous. Ovary densely villous, narrowed below into the short free stipes, above into the slender at length glabrous style; ovules 5–6. Legume not seen.

Upper Guinea. Senegambia, *Heudelot!* Eppah, *Barter!* Nun river and Fernando Po, *Mann!*

M. Baillon finds occasionally 5 sepals (Adansonia, vi. 200). A specimen of probably the same species is in the British Museum Herbarium from S. Leone (*Afzelius*), with an immature fruit—compressed about 1 in. long and nearly as broad, very oblique, the valves coriaceous, transversely rugulose, tawny-tomentose.

27. **DETARIUM**, Jussieu; Benth. et Hook. f. Gen. Plant. i. 585.

Calyx divided nearly or quite to the base into 4 (rarely 5) segments, subvalvate with very narrowly bevelled imbricate margins. Petals 0.

Stamens 10, free; anthers elliptical or rotundate, versatile, dehiscing longitudinally. Ovary sessile, 2-ovulate, ovules pendulous; style slender, stigma terminal, capitellate. Legume drupaceous, indehiscent, thick, roundish, compressed, with strong fibres traversing the mesocarp, a bony endocarp and crustaceous epicarp. Seed solitary, exalbuminous. —Unarmed trees, glabrous or pubescent. Leaves abruptly pinnate, though from the frequent alternation of the leaflets seeming imparipinnate at first sight, more or less translucently gland-dotted. Stipules inconspicuous. Flowers paniculate, small, white or pale, fragrant. Bracts and bracteoles minute, caducous. Fruit edible.

Confined to Tropical Asia.

1. **D. senegalense,** *Gmelin; DC. Prod.* ii. 521. Tree; extremities pubescent or glabrous and more or less glaucous. Leaflets 6–12, alternate or opposite, elliptic- or ovate-oblong, obtuse, entire or emarginate at the apex, base, excepting sometimes in one or two of the upper leaflets, broadly rounded, broadly and obscurely undulate-crenate or entire, glabrous or very thinly pubescent, sometimes glaucous beneath, reticulate when dry, more or less coriaceous, variable in size, averaging 1½–2 in. in length in the typical (originally described) form, 2–3 (4½) in. in others; petiolules 1½–2 lines. Flowers small, in axillary fascicled or solitary panicles, often from the nodes of fallen leaves or scales, 1 or 2–6 in. in length, each with a distinct rachis giving off alternate lateral racemes or spikes. Bracts minute, concave, very early deciduous. Pedicels very short or 0. Sepals 2–2½ lines long, pilose or nearly glabrous within. Fruit usually nearly round, compressed, 1½–2½ in. in diameter, 1–1½ in. in thickness; epicarp thinly crustaceous when dry, smooth or nearly so, the pulpy edible mesocarp is traversed by numerous fibrous processes from the surface of the bony endocarp. Seed compressed, about 1 in. in diameter.—Fl. Senegambiæ, i. 269, t. 59.—*D. microcarpum*, Guill. et Perr. Fl. Seneg. i. 271; *D. Heudelotianum*, Baill. in Adans. vi. 201.

Upper Guinea. *α*. Leaflets usually 8–12, 1½–2½ in. long, rachis often thinly pilose. Panicles usually below the leaves. Flowers subsessile; connective of the anthers (at least sometimes) minutely apiculate. Senegambia, *Perrottet!* Gambia, *Heudelot!*

β. Leaflets about 8, 2–3 or even 5 in. long, glabrous and glaucous. Panicles glaucous or pulverulent-glaucous; flowers shortly pedicellate; anthers muticous. Niger, *Barter! Dr. Baikie!*

North Central. Bornu (*Schweinf. in Reliq. Kotsch.* ii.).

Nile Land. Nuba Mountains South of Kordofan, *Kotschy* (Schweinf. l. c.).

The Upper Guinea forms *α* and *β* may prove specifically different, but there exist intermediates (Senegambia, *Heudelot*, No. 571) which hardly justify their separation at present. The tree is described both by Guillemin and Perrottet and by Barter to be a small one (15–25 ft.), but the Governor of the Gambia sends to the Kew Museum sections of the trunk 2 ft. or 2 ft. 6 in. in diameter.

28. **COPAIFERA,** Linn.; Benth. et Hook. f. Gen. Plant. i 585.

(As to the African species with unijugate leaves). Flowers small. Calyx divided nearly or quite to the base into 4 more or less imbricate

segments. Petals 0. Stamens 10, free; filaments glabrous; anthers elliptical, versatile, dehiscing longitudinally. Ovary shortly stipitate, compressed; style involute in bud, slender, stigma capitate; ovules 2 (–4), superposed. Legume stipitate or sessile, flat or compressed, falcate-ovate or somewhat semi-orbicular, coriaceous, 1-seeded. Seed exalbuminous, with or without an aril; cotyledons plane plano-convex or plicate.—Unarmed trees. Leaflets unijugate, coriaceous, very oblique. Flowers in terminal or axillary panicles or racemes.

Chiefly a Tropical American genus. The following species are peculiar to this Flora, unless it be *C. coleosperma*. *C. Mopane* may prove generically distinct.

Leaflets 1-nerved, penniveined	1. *C. coleosperma.*
Leaflets 3–4 nerved.	
Buds sessile, ellipsoidal; bracteoles closely investing base of calyx	2. *C. Guibourtiana.*
Buds subsessile, globose; bracteoles obsolete	3. *C. Gorskiana.*
Leaflets 7–9-nerved	4. *C. Mopane.*

1. **C. coleosperma,** *Benth. in Linn. Trans.* xxv. 316, t. 43 A. A large tree; branches slender, wholly glabrous. Leaflets unijugate, falcate-ovate or oblong-ovate, obtusely acuminate or more broadly pointed, coriaceous, glabrous, strongly reticulate, 2–2¾ in. long, 1–1⅓ in. broad, petiolules about 1 line, petiole ½–1 in. Flowers (not seen) in terminal and axillary panicles. Legumes much compressed, coriaceous, somewhat semiorbicular, glabrous, rugulose or finely tuberculate-corrugate when dry, ¾–1¼ in. long on a gynophore of 2–3 lines. Seeds conspicuously arillate; testa shining; cotyledons plano-convex, uniform, not resiniferous.

South Central. Batoka highlands, *Dr. Kirk!*

Dr. Kirk states that in some localities this tree "has been planted at least 100 years ago." The red aril is used in preparing a nourishing drink.

As pointed out by Mr. Bentham, this plant—so far as fruiting specimens enable one to judge—is identical with the Cuban *C. hymenæifolia*, excepting in the aril. Are they the same species? Which, if either, is the introduced plant?

The leaflets in this species are more completely penniveined than in *C. Gorskiana*, in which the nervation is that of *Bauhinia*, the principal nervures usually radiating from the base.

2. **C. Guibourtiana,** *Benth. in Linn. Trans.* xxv. 317. Tree; extremities rather stout sinuous rugulose, giving off numerous ascending branches, puberulous or obsoletely pubescent at first. Leaflets 1-jugate, coriaceous, broadly semi-elliptical or -obovate, obtusely acuminate, 3–4-nerved with subprominent reticulation, 2½–3½ in. long, 1–1⅓ in. broad, sessile; petiole 2 lines. Flowers numerous, sessile in panicled ascending spikes, overtopping the leaves. Bracts ovate, 1–1½ lines long, caducous. Bracteoles truncate or broadly rounded, closely investing the base of the calyx. Buds ellipsoidal, 2 lines long. "Sepals 4, imbricate, coriaceous, subequal in length, elliptical, obtuse, glabrous. Ovules 2–4." I have not seen expanded flower or fruit.—*Guibourtia copallifera*, Bennett in Journ. Linn. Soc. i. 150.

Upper Guinea. Sierra Leone, *Dr. Daniell!*

Called Kobo tree by the natives. Said to afford a valuable copal. "Wood odoriferous."

3. **C. Gorskiana,** *Benth. in Linn. Trans.* XXV. 317. A much-branched tree, sometimes of considerable size; extremities slender, pubescent at first. Leaflets unijugate, very obliquely and broadly ovate or subfalcate-ovate, very obtuse or shortly usually broadly pointed, much rounded at the base on the outer margin, coriaceous, glabrous, reticulate, gland-dotted, 1–2½ in. long, ¾–1⅓ in. broad; petiole ¼–½ in. Panicles terminal and from the upper axils, branches pubescent; bracteoles caducous. Flowers small, white, subsessile or pedicels barely ½ line; buds nearly globose. Sepals about 2 lines long. Filaments filiform, glabrous. Ovary glabrous, shortly stipitate; ovules superposed. Legume flat, obliquely ovate- or obovate-rotundate, reticulate, the cavity not occupying the entire area of the fruit. Seed much compressed, exarillate. "Cotyledons fleshy, without resinous granules" (Dr. Kirk).—*Gorskia conjugata,* Bolle in Peters' Mossamb. Bot. 16, t. 3.

Mozamb. Distr. Zambesi, Senna and Tette, *Dr. Peters!* Between Tette and the coast, *Dr. Kirk!*

Dr. Kirk states that the tree affords a good hard timber.

4. **C?** (*Colophospermum*) **Mopane,** *Kirk; Benth. in Linn. Trans.* XXV. 317. A fine forest tree, the trunk often 2 ft. in diameter; extremities glabrous. Leaflets unijugate, sessile, elongate-semi-ovate, inner margin nearly straight to the narrowed obtuse apex, at right angles to the basal margin or semicordiform, coriaceous, glandular-dotted and minutely glandular-crenulate, 7–9-nerved, reticulate, 2–3½ in. long, 1–1½ in. broad at base; petiole 1 in. more or less. Stipules oblong or ovate, 1–2 lines, deciduous. Inflorescence not seen, but probably in short axillary racemes. Pedicels ⅙–⅓ in. Legume flat, thinly coriaceous, rather obscurely reticulate, in outline obliquely semicircular or resembling a somewhat lengthened nautilus from the rounded gibbosity beyond the scar of the style; 1½–2 in. long; gynophore 0, or very short. Seeds reniform or oblong, testa deeply convolute-corrugate with large resinous glands; cotyledons contort-plicate, thin, not resiniferous.

Lower Guinea. Near Bumbo, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Lupata, Zambesi, *Dr. Kirk!*

Dr. Kirk's note appended to our specimens says that this is "the Iron-wood tree of the country, abundant in dry clay plains, forming large monotonous shadeless forests. . . . . Wood in the heart dark, heavy, and very durable, difficult to work. Leaves folding up at the junction of the leaflets . . . . and turning down at the articulation with the stem; they are thus shadeless during the dry season at noon." The fruit falls in September.

29. **HARDWICKIA,** Roxb.; Benth. et Hook. f. Gen. Plant. i. 586.

Flowers small, in paniculate spiciform racemes. Calyx-tube extremely short, segments 5, rotundate, subequal, broadly imbricate. Petals 0. Stamens 10, occasionally a few anantherous; filaments free; anthers rotundate, small, versatile, dehiscing longitudinally. Ovary sessile, 1–2-ovulate; style slender, stigma terminal, minute (in African species). Legume (not seen in the following species), obovate or ob-

ovate-cuneate, compressed, 1-seeded and dehiscent in 2 valves at the apex; seed exalbuminous (according to Mr. Bentham, l.c. in an Indian species).—Unarmed trees. Leaflets 1–3-jugate, coriaceous. Flowers small in terminal and axillary panicled racemes or spikes. Bracts and bracteoles minute.

There are two Indian species besides the following, which is peculiar to W. Tropical Africa.

1. **H ? Mannii,** *Oliv.* A tree of 30–80 ft. (*Mann*); wholly glabrous, extremities terete, moderately stout. Leaflets unijugate or occasionally 3–4-foliolate, coriaceous, oblong or elliptic-oblong, apex rounded or obtusely pointed, slightly rounded at base, midrib rather prominent beneath, often rather eccentric, reticulation not distinct; petiolules stout, 1–2 lines, petiole very short and thick, but 1 or 2 lines in unijugate leaves. Stipules deciduous, not observed. Flowers white, 2–3 lines in diameter, very numerous, in panicled straight spiciform racemes from the upper axils and extremities. Bracts and bracteoles minute, squamiform. Pedicels $\frac{1}{2}$–1 line or less. Calyx-lobes thin, rotundate. Stamens 10, exserted. Ovary pilose, sessile, narrowed into the slender tapering style. Stigma minute, terminal. Ovule solitary (or geminate). Legume not seen.—*Copaifera ? Mannii*, Baill. in Adans. vi. 202.

Upper Guinea. Camaroons and Kongui rivers, *Mann!*

30. **CYNOMETRA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 586.

Calyx-tube obsolete or shortly turbinate, limb of 4 (or 5) segments, imbricate in æstivation, usually reflexed at flowering. Petals 5, subequal, or 2 anterior minute. Stamens 10 (or ∞), filaments filiform, free or very shortly cohering at base; anthers small, elliptical or rotundate, versatile, dehiscing longitudinally. Ovary sessile or shortly stipitate, style usually filiform, stigma terminal; ovules solitary or geminate. Legume obliquely ovoid obovoid or reniform, turgid or more or less compressed, usually rugose, 2-valved, 1-seeded. Seed exalbuminous; cotyledons large, fleshy, plano-convex.—Unarmed trees or shrubs. Leaves abruptly pinnate, leaflets 1–6-jugate, more or less coriaceous, 1-nerved. Stipules caducous. Flowers small, in axillary or rarely terminal racemes, often very short. Bracts dry or scarious, small, deciduous; bracteoles small, in § *Hymenostegia* petaloid, persistent.

A considerable Tropical genus, common to both hemispheres. None of the African species have been identified with any other.

Bracteoles caducous or not petaloid nor exceeding 1–2 lines. Calyx-tube obsolete. Petals 5.
- Leaflets 1- (rarely 2-) jugate. Bracteoles concave, enveloping the early bud . . . . . 1. *C. Vogelii.*
- Leaflets 3-jugate, with a narrow emarginate acumen. Bracteoles narrow, not enveloping the early bud . . . . . 2. *C. Mannii.*

Bracteoles membranous petaloid persistent, $\frac{1}{4}$–$\frac{1}{2}$ in. long. Calyx-tube turbinate. Two lower petals minute.
- Leaflets 4–6-jugate, trapezoidal . . . . . 3. *C. floribunda.*

Leaflets 1–2-jugate, ovate-lanceolate, falcate, acuminate. Flowers stipitate beyond the bracteoles . . . . . 4. *C. laxiflora.*
Leaflets 2-jugate, ovate-elliptic, acuminate. Bracteoles at base of calyx-tube . . . . . 5. *C. Afzelii.*

1. **C. Vogelii,** *Hook. f. Fl. Nigrit.* 328. A small tree or shrub-like; extremities leafy, glabrous or finely pubescent at first. Leaflets unijugate, rarely bijugate, sessile, more or less coriaceous, oval oval-oblong or oblanceolate-oval, but slightly oblique, narrowed to the broad obtuse usually emarginate or minutely bifid apex, glabrous or with faint pubescence on the midrib beneath, reticulation not prominent, 1½–3½ in. long, ½–1¼ in. broad; petiole short and thick, ¼ in. or less. Flowers white or rose in very short, often dense and many-flowered pubescent racemes or fascicles. Pedicels ⅙–¾ in., slender. Bracts scarious, concave, broadly rotundate, 1 line long, deciduous, closely imbricate over the unopened racemes; bracteoles concave or conduplicate, carinate, before the lengthening out of the pedicel wholly enclosing the bud, their margins valvate on the outer convex surface, imbricate on the inner face, caducous or occasionally remaining till expansion on the lower part of the pedicel. Calyx-lobes 4, 2 considerably narrower. Petals subequal, oval or oblong, acute or apiculate. Stamens usually 10. Ovary pilose, more or less stipitate, 1-ovulate. Legume thick, falcate, shortly oblong, rugose or corrugate, ¾–1¼ in. long. Var. *α.* Pedicels about ¼ in. long. Var. *β.* (*Heudelotiana*, Planch. mss. in Hb.) pedicels ½–¾ in. long.

Upper Guinea. Senegambia, *Heudelot!* Rio Nuñez, *Whitfield!* Niger, *T. Vogel! Ansell, Barter!*

In one of the Senegambian specimens gathered by Heudelot, many of the leaflets are bijugate, but I do not notice any other difference.

2. **C. Mannii,** *Oliv.* A tree attaining 50–60 ft. (*Mann*); extremities puberulous or thinly pubescent. Leaflets usually 3-jugate, those of the upper pair considerably larger, coriaceous, shining above, sessile, obliquely oblanceolate-oval or -oblong, narrowed above into a distinct often narrow emarginate acumen, glabrous, rachis often pubescent; upper leaflets 1⅓–3 in., lower ½–1 in. long. Flowers white, in axillary and subterminal pubescent racemes not exceeding 1½ in. in length. Pedicels ¼–½ in. Bracts broadly rotundate, scarious, 1-2 lines long, caducous; bracteoles narrow, oblong, keeled, by no means enveloping the bud before the growth of the pedicels, caducous. Calyx-lobes 4, unequal in breadth. Petals 5, linear-oblong or -oval. Stamens 10; connective rather broad when fresh. Ovary pilose, uniovulate. Legume obliquely obovoid or ovoid, valves rather thin, rugose, 1¼–1½ in. long.

Upper Guinea. Ambas bay and Gaboon river, *Mann!* Old Calabar, *Thomson!* Congo, *Smith!*

Belonging to the same or a new and allied species is a plant collected in Guinea by Hove, in the British Museum Herbarium, with very dense ferruginous racemes; the leaflets 3-jugate, those of the upper pair 3½ in., of the lower 2½ in. long, the disparity between the upper and lower leaflets being less marked than in Mr. Mann's plant. I have not made an analysis of the flower.

3. **C.** (*Hymenostegia*) **floribunda,** *Benth. in Linn. Trans.* XXV. 318. A tree of 30 ft. (*Mann*); extremities puberulous at first, early glabrous. Leaves 2–3 in. long, leaflets sessile, in 4–6 pairs, obliquely trapezoidal, obtuse or very obliquely broadly pointed, coriaceous, glabrous or thinly and very minutely pubescent beneath at first, $\frac{1}{2}$–$1\frac{1}{2}$ in. long, the upper leaflets usually the longer. Flowers in simple racemes 2–3 in. long from the upper axils, collectively forming ample leafy panicles; rachis of raceme pubescent. Pedicels about $\frac{1}{4}$ in. long. Bracts caducous. Bracteoles petaloid, in pairs a little under the calyx-tube, broadly ovate, sessile, with a cordate base, $\frac{1}{4}$–$\frac{1}{3}$ in. long, persistent at least until expansion. Calyx glabrous or nearly so, tube turbinate, segments of limb 4. Posterior and 2 lateral petals ovate- or obovate-oblong, 2 anterior minute. Stamens 10. Ovary hairy, the stipes partly adherent to the side of the calyx-tube; style glabrous. Ovules 2. Fruit not sent home.

Upper Guinea. Muni river, lat. 1° N., *Mann!*

4. **C.** (*Hymenostegia*) **laxiflora,** *Benth. in Linn. Trans.* XXV. 318. A glabrous tree of 25–40 ft. or more; extremities slender. Leaflets submembranous or at length coriaceous, 1–2-jugate, usually 1-jugate, when 2-jugate the upper pair much larger than the lower, ovate-lanceolate falcate acuminate, base very oblique, upper or only leaflets 2–4 in. long; petiole 3–5 lines. Racemes terminal, simple, glabrous, few-flowered. Pedicels slender, 3–5 lines long. Bracteoles petaloid, similar to those of *C. floribunda*, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{8}$–$\frac{1}{4}$ in. below the calyx. The structure of the flower so far as I have ascertained is similar to that of the foregoing, the ovary, however, is glabrous. Ovules 2.

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

Dr. Welwitsch describes the flowers as whitish rose-coloured, the heart-wood as deep-rose or blood-colour, tough and durable.

In the same province of Angola Dr. Welwitsch collected specimens of a nearly allied plant in fruit only, differing in the leaflets being rarely 1-jugate, shining, and more coriaceous in texture. The legume is very oblique, about 3 in. long, $1\frac{1}{3}$ in. broad, the valves thinly but firmly coriaceous, each separating in two layers when dry. It may be distinguished as var. *nitidula.* Welw.

5. **C.** (*Hymenostegia*) **Afzelii,** *Oliv.* Very near to *C. laxiflora.* Extremities and inflorescence minutely puberulous. Leaflets rather coriaceous, 2-jugate, upper pair much larger, obliquely elliptical or ovate-elliptical, acuminate, usually obliquely cuneate at base, glabrous, without the minute subprominent reticulation of *C. laxiflora;* petiole winged. Terminal racemes few- or several-flowered. Bracteoles as in the above, inserted at the base of the calyx-tube.

Upper Guinea. Sierra Leone, *Afzelius!*

31. APHANOCALYX, Oliver in Hook. Ic. Plant. xi. 53.

Flowers enclosed in bud between a pair of sepal-like valvate bracteoles. Calyx obsolete or reduced to minute teeth. Petal 1, posterior,

obovate-cuneate or roundish exceeding the bracteoles, lateral and anterior petals obsolete, or one of the lateral ones occasionally developed shorter than or nearly equalling the posterior. Stamens 10, all antheriferous, filaments filiform, glabrous, free or minutely coherent at base; anthers small, broadly elliptical, versatile, dehiscing longitudinally. Ovary densely hairy, shortly stipitate, biovulate; style filiform, stigma terminal, capitate. Legume not seen.—Tree, unarmed, glabrous excepting the inflorescence. Leaflets unijugate, coriaceous, 2–3-nerved. Flowers in short, dense, axillary racemes. Bracts scarious, deciduous; bracteoles enclosing the bud, spreading or reflexed during flowering.

Based upon the following species which I met with sorted away in *Cynometra*, with which genus it agrees remarkably in habit. It is highly probable that future discoveries will materially modify our treatment of the few species of *Cæsalpinieæ*, distributed in almost as many genera as species, in which the calyx is either obsolete or reduced to minute squamæ, and the buds enclosed between valvate bracteoles.

1. **A. cynometroides,** *Oliver in Hook. Ic. Pl.* t. 1066. A tree of 50 ft. (*Mann*), wholly glabrous excepting the inflorescence. Leaflets unijugate, coriaceous, shining, obliquely subsemi-elliptical or obovate-oblong, shortly and rather acutely acuminate, distinctly 2-nerved with a third outer faint nervure soon evanescent, sessile; 2½–3½ in. long, 1–1¾ in. broad; petiole stout, ¼ in. or less. Racemes dense, rusty-pilose, axillary and terminal, solitary or fascicled, not exceeding 1–1½ in. in our specimens. Bracts broadly rotundate-ovate obtuse or broadly pointed, firm, or scarious in texture, longitudinally ∞-nerved, about 2 lines long. Pedicels 1–2 lines. Bracteoles persistent during flowering, inserted immediately under the flower, broadly ovate-elliptical, mucronate, strigose-pilose outside, 2 lines long. Petal rotundate or broadly ovate, subcuneate at base, slightly exceeding the bracteoles.

Upper Guinea. Mount John, Kongui river, *Mann!*

32. BURKEA, Hook.; Benth. et Hook. f. Gen. Plant. i. 587.

Flowers small, subregular. Calyx campanulate 5-fid, lobes 5, rounded. Petals 5, subequal obovate or elliptical obtuse, imbricate in æstivation. Stamens 10, antheriferous; filaments rather short; anthers oblong, with a minute, apiculate connective, versatile, 2-celled, dehiscing longitudinally. Ovary subsessile, hirsute, 1–2-ovulate; style very short, thick, stigma obliquely truncate or concave. Legume oblong or elliptical, obtuse, flat, thinly coriaceous. Seed compressed, albuminous; cotyledons thin, flat; radicle short, thick, included in basal notch.—Small unarmed tree or shrub, with stout extremities. Leaves abruptly bipinnate, pinnæ 1–3–6-jugate opposite or subopposite, leaflets usually 6–12 to each pinna, alternate, petiolulate or subsessile, ovate to oblong, obtuse. Stipules minute or obsolete. Flowers small, in slender, simple, or sparingly branched axillary spikes, collected with the tufted leaves at the ends of the branches.

Confined to Africa.

The cartilaginous layer described in "Genera Plantarum," l.c. as belonging to the testa, I regard as albumen.

1. **B. africana,** *Hook. Ic. Plant.* vi. 593–4. Shrub or small tree attaining 30 or 35 ft.; extremities stout, ferruginous-pubescent at first. Leaves collected towards the ends of the branches, at length ¾–1 or sometimes 2 or 3 ft. long; rachis smooth, glabrous, or clothed with deciduous, ferruginous tomentum; pinnæ usually in about 3 pairs (5–6 in var. *angolense*); leaflets very variable in size, when fully developed from 1 to (exceptionally) 3 or 4 in. in length, broadly ovate or elliptic-ovate, varying in some forms to elliptical or oblong, very obtuse, entire or minutely emarginate, on first unfolding thinly silvery with appressed hairs, early glabrous, and at length sometimes subglaucous, thinly coriaceous, reticulation not prominent. Spikes sparingly tomentose pubescent or glabrous, simple or panicled, ½–1 ft. long. Flowers "white, fragrant," numerous, about ¼ in. in diameter. Bracts minute, squamiform. Legume 1¼–2½ in. long, narrowed at the base into a stipes of ⅕–⅓ in.

Upper Guinea. Nupe Niger, *Barter!*

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!* Var. *andongensis.* Pinnæ in 5–6 pairs; leaflets elliptic-oblong, 9–13 to each pinna. Golungo Alto, Angola, *Dr. Welwitsch!*

This may prove a distinct species. The specimens are past flowering. The legumes agree with the type. Dr. Welwitsch collected fruiting specimens of another variety in Huilla (var. *cordata*, Welw.), distinguished by its more or less distinctly cordate-based subsessile or very shortly petiolulate leaflets.

33. ERYTHROPHLŒUM, Afzelius; Benth. et Hook. f. Gen. Plant. i. 588.

Flowers small, regular. Calyx campanulate 5-fid, lobes ovate or lanceolate. Petals 5, oblanceolate, imbricate, pilose externally, but slightly exceeding the calyx. Stamens 10, free, filaments filiform glabrous; anthers small, broadly elliptical or rotundate, dorsifixed. Ovary stipitate, pilose-tomentose, 5–8-ovulate; style short or obtuse, terminal stigma at first subsessile, style at length accrescent. Legume oblong, follicular (by the dorsal suture) or 2-valved in dehiscence; valves thickly coriaceous, smooth or but faintly transversely ridged externally. Seeds usually 5–8, transverse, compressed, albuminous; cotyledons flat, elliptical, with an emarginate base embracing the lower half of the short thick radicle.—Unarmed trees. Leaves bipinnate; leaflets alternate petiolulate. Flowers very shortly pedicellate in dense spiciform, paniculate racemes, collected at the extremities of the branches. Bracts minute or obsolete; bracteoles 0.

Besides the following, confined to W. Africa, there is a Tropical Australian species.

1. **E. guineense,** *Don, Gard. Dict.* ii. 424. A large tree from 40 to about 100 ft. in height; extremities at first finely rusty-puberulous, early glabrous. Pinnæ in 2–4 nearly opposite pairs ½ ft. more or less

in length; leaflets of each pinna 6–11, ovate-elliptical lanceolate or elliptic-oblong, more or less oblique, obtusely usually shortly acuminate often submarginate, rounded or broadly cuneate at base, midrib and venation rather prominent, glabrous, or midrib pubescent beneath; 1½–4½ in. long; petiolule ⅛–¼ in. Flowers crowded, ⅙ in. long, pubescent; the petals pilose-tomentose towards the margin. Stigma at first subsessile concealed by the long tomentum of the ovary, at length borne upon a distinct, nearly glabrous style. Follicular legumes 2½–5 in. long, 1–1½ in. broad, usually 5–8-seeded, apex obtusely rounded or broadly apiculate, base at length very oblique, obtuse; gynophore ¼–1 in. long.—*Fillæa suaveolens*, G. et P., Fl. Seneg. 242, t. 55. *Erythrophlæum ordale*, Bolle in Peters' Mossamb. Bot. 10. *Mavea judicialis*, Bertol. Plant. Mozamb. 10, t. 3; *Erythrophlæum judiciale*, Procter in Am. Journ. Pharm. 18, 195.

Upper Guinea. Senegambia, *Perrottet! Heudelot!* &c. Sierra Leone, *Afzelius!* &c. *Brass, Barter!* Nun river, *Mann!*

Mozamb. Distr. Boror, Zambesia, *Dr. Peters.*

The bark is powerfully poisonous, and is administered by native tribes in widely remote regions as an ordeal.

Dr. Bolle, who had only fruiting specimens to describe, states, l. c., that the legumes are 6 in. long by about 1 in. broad. I have not seen fruits so narrow in proportion to their length from Western Africa, but Mr. Baker, who has compared Dr. Bolle's plant with Barter's, has noted them as specifically identical.

Guillemin and Perrottet, l. c., state that the seeds are invested with pulp. Of this but little or no trace remains in the dry fruit. I have not seen specimens of the *Erythrophlæum* or Cassa of the Congo referred to by R. Brown in "Botany of Congo," 430.

SUBORDER III. MIMOSEÆ. (By Prof. Oliver.)

Flowers regular, usually 5-merous (4–6-merous). Sepals usually connate in a 5-toothed or -lobed calyx. Petals as many as sepals, free or connate, hypogynous or subperigynous, valvate in æstivation. Stamens as many or twice as many as petals or indefinite, free or monadelphous; anthers minute, dehiscing longitudinally. Seeds elliptical or roundish compressed. "Albumen 0 or sparing. Radicle short straight."—Shrubs or trees, rarely herbaceous. Leaves bipinnate. Flowers small, sessile or shortly pedicellate, capitate or spicate.

Of the 28 genera of this Suborder, 17 are represented in Tropical Africa. Not one is peculiar to this Flora.

TRIBE 1. **Parkieæ.**—*Calyx-teeth imbricate. Stamens* 5 *or* 10; *anthers with a deciduous apical gland.*

Stamens 5, staminodia 10–15. Flowers spicate	1. PENTACLETHRA.
Stamens 10, staminodia 0. Flowers capitate	2. PARKIA.

TRIBE 2. **Adenantheræ.**—*Calyx valvate. Stamens* 10 (*rarely* 5); *anthers with a deciduous apical gland.*

Flowers spicate. Sutures of legume persisting after separation of the 1-seeded articles	3. ENTADA.
Flowers spicate. Legume 2-valved, flat, coriaceous, continuous .	4. PIPTADENIA.
Flowers racemose. Legume linear, 2-valved, valves coriaceous, entire (turgid over the brightly coloured seeds)	5. ADENANTHERA.

Flowers in spiciform racemes. Legume indehiscent, valves with a longitudinal thick wing or keel	6. TETRAPLEURA.
Flowers spicate. Legume subterete, indehiscent, with septa between the seeds	7. PROSOPIS.
Flowers spicate, lower neuter, upper perfect. Legume linear, compressed, twisted, indehiscent or dehiscing irregularly . .	8. DICHROSTACHYS.
Flowers capitate, lower neuter, upper perfect. Legume oblong, compressed, 2-valved (Aquatic herb)	9. NEPTUNIA.

TRIBE 3. **Eumimoseæ.**—*Calyx valvate or setaceous and rudimentary. Stamens* 5 *or* 10 (4–8); *anthers eglandular; pollen granular.*

Flowers capitate. Legume narrow-linear, straight, 2-valved; valves obliquely depressed between the seeds	10. DESMANTHUS.
Flowers capitate (in Trop. African sp.). Valves of legume separating from the persistent narrower sutures	11. MIMOSA.
Flowers capitate. Legume linear, straight, prickly; narrow valves separating from the persistent broader sutures . . .	12. SCHRANKIA.
Flowers capitate. Legume broadly linear, flat, 2-valved; valves continuous	13. LEUCÆNA.

TRIBE 4. **Acacieæ.**—*Calyx valvate. Stamens indefinite, free or consolidated at base only with disk; pollen-grains cohering in masses.*

Only genus	14. ACACIA.

TRIBE 5. **Ingeæ.**—*Calyx valvate. Stamens indefinite; filaments united more or less in a tube; pollen-grains cohering in masses.*

Flowers capitate. Legume 2-valved, flat, straight; valves coriaceous, separating elastically from above	15. CALLIANDRA.
Flowers capitate (in African sp.). Legume flat, straight, oblong or broadly linear, indehiscent, or 2- valved; valves not elastic .	16. ALBIZZIA.
Flowers capitate (in African sp.). Legume compressed, coriaceous, circinate, constricted between the seeds	17. PITHECOLOBIUM.

1. **PENTACLETHRA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 588.

Flowers pentamerous, hermaphrodite (or dicœcious). Calyx small campanulate, with 5 broadly rotundate imbricate lobes. Petals connate below, elliptical or oblong, valvate in æstivation. Stamens 5, alternate with the petals, much exserted; anthers with a minute apical gland and broad cellular disk on the connective of the inner face; staminodia filiform 10 or 15, opposite to the petals, and with the stamens and inner crenate-margined disk adnate to the base of the united petals. Ovary subsessile; style equalling the ovary; stigma obliquely capitellate terminal; ovules indefinite, 6–8 or more. Legumes 2-valved, elongate, compressed, narrowed to the base, valves woody, elastically revolute when mature. Seeds compressed, exalbuminous; testa coriaceous or crustaceous, shining; cotyledons flat, fleshy; radicle sheathed by the base of the cotyledons.—Unarmed trees. Leaves bipinnate; pinnæ subopposite in numerous pairs, leaflets multijugate shining. Stipules small, subulate, deciduous. Flowers numerous spicate; spikes usually panicled towards the extremities.

1. **P. macrophylla,** *Benth. in Hook. Journ. Bot.* 1842, 330. A tree of 15–60 ft. or higher; extremities at first rusty-furfuraceous. Leaves ample 1–2 ft. or probably often longer, rachis minutely often sparsely

scurfy, eglandular; pinnæ opposite or subopposite in about 10–13 pairs; leaflets 14–18-jugate, obliquely oblong, obtuse, entire or emarginate, somewhat rigid, at length glabrous, shining above, oblique, midrib and venation prominent beneath; $\frac{3}{4}$–$1\frac{1}{4}$ in. long, 3–5 lines broad, sessile. Stipules subulate, deciduous. Spikes long, narrow, interrupted or rather dense, solitary or in pairs from leafless nodes, panicled towards the extremities. Flowers "yellowish," sessile. Calyx-lobes broadly rotundate. Petals elliptic-oblong, spreading. Stamens and 10 or 15 filiform staminodia slightly thickened above, much exserted. Legumes 20–25 in. long, $3\frac{1}{2}$–4 in. broad, narrowed to the base; valves thick and woody, at length becoming strongly revolute when dry. Seeds much compressed, various in circumscription, 2–$2\frac{1}{2}$ in. long, 1–2 in. broad; testa crustaceous, shining.

Upper Guinea. Senegambia, *Heudelot!* Fernando Po, *T. Vogel! Barter!* Camaroons river, *Mann!* Island of St. Thomas, *Mann.* Gaboon river, *Griffon du Bellay.* Princes Island, *Dr. Welwitsch!*

The legumes have been sent home under the name of "*Opochala.*" The seeds are edible, and yield an oil. The remarkable hygroscopicity of the valves of the mature legume I have described in detail in the "Transactions of the Linnæan Society," xxiv. 415.

M. Baillon (Adans. vi. 206) indicates, under the name *P? Griffoniana*, a plant collected by M. Griffon du Bellay in the Gaboon country, of which he has not seen either flower or fruit, but which, from the foliage, he takes to be a new *Pentaclethra.* It presents on the upper surface of the leaflets 1 or 2 small sessile concave glands. It is called *N'tchiumbou.*

2. **PARKIA**, R. Br.; Benth. et Hook. f. Gen. Plant. i. 588.

Flowers pentamerous, capitate; the upper flowers of the head hermaphrodite, the lower staminate or neuter. Calyx tubular with a shortly 5-lobed bilabiate limb, the two lower segments larger. Petals narrowly linear-spathulate, confluent below with the stamens, valvate or nearly so in æstivation. Stamens 10, exserted; filaments adnate below with the petals, and consolidated at length with the base of the calyx-tube; anthers linear or oblong, unappendaged, pollen cohering in indefinite granular pollinia; staminodia 0. Ovary stipitate or sessile, multiovulate; style slender, with a minute terminal stigma. Legume elongate (or oblong), compressed or subcylindrical, at length 2-valved, coriaceous or somewhat woody. Seeds compressed, involved in fleshy at length dry and mealy pulp; testa coriaceous; cotyledons fleshy, radicle included; albumen 0.—Large unarmed trees. Leaves bipinnate, with very numerous leaflets. Flowers in dense globose or clavate many-flowered pedunculate at length pendulous heads, red or reddish brown, each subtended by a narrow bracteole, dilated at the apex.

The anthers of *Parkia* are described by inadvertence in the Genera Plantarum (l. c.) as gland-appendaged. Mr. Bentham, however, in Hook. Journ. Bot. 1842, 328, pointed out that they were not glandular.

Leaflets 3–6 lines, 1-nerved, in 50–70 pairs, pinnæ 14–30 pairs . .	1. *P. biglobosa.*
Leaflets 6–8 lines, subtriplinerved, in 25–35 pairs, pinnæ 8–12 pairs	2. *P. intermedia.*
Leaflets 6–12 lines, triplinerved, in 16–24 pairs, pinnæ 6–9 pairs .	3. *P. filicoidea.*

1. **P. biglobosa,** *Benth. in Hook. Journ. Bot.* iv. 1842, 328. Tree of 40–50 ft. Leaves averaging from 9–18 in. in length by 5–10 in. in breadth; rachis pubescent or puberulous, occasionally faintly ridged or angular with sessile glands at the base of the last or last two pinnæ; pinnæ alternate or subopposite in from 14–30 pairs; leaflets linear-oblong, obliquely pointed (or obtuse), obtusely subauriculate on the lower margin at the base, usually in 50–70 pairs, 3–6 lines long, 1 line broad more or less, 1-nerved with divergent lateral veinlets. Legume 8–12 in. long, $\frac{3}{4}$ in. broad more or less, compressed, valves often distinctly depressed between the seeds, straight or falcate, on a stipes of 1 in.—*Inga biglobosa*, Willd. Sp. Pl. iv. 1025; P. de Beauv. Fl. Ow. et Ben. ii. 53, t. 90. *I. senegalensis*, DC. Prod. ii. 442; *Mimosa taxifolia*, Pers. Syn. ii. 266. *Parkia africana*, R. Br. in Plants of Oudney, &c., 29. *P. uniglobosa*, Don, Gen. Syst. ii. 396. For Indian synonymy see Mr. Bentham's paper cited above.

Upper Guinea. Senegambia, *Perrottet!* Sierra Leone, *Barter!* and others.
Nile Land. Upper Nile (*Schweinf. et Asch. Enum.*).
No doubt in North Central Africa, but I cannot give any precise locality.
It occurs also in India.
The pulp of the pods is eaten and the torrefied seeds are used as coffee or chocolate.

2. **P. intermedia,** *Oliv.* Tree of 30–50 ft. Leaves 1–$1\frac{1}{3}$ ft. long, 8–10 in. broad; rachis subterete glabrate, with glands at the base of the uppermost pinnæ; pinnæ in 8–12 pairs; leaflets linear-oblong, obtuse, glabrous in 25–32 pairs, lower lateral nervures directed forwards, early evanescent, 6–8 lines long, $1\frac{1}{2}$ lines broad. Peduncles at length elongate, somewhat panicled at the extremities. Heads clavate, 3 in. long, 2–$2\frac{1}{2}$ in. in diameter. Legume compressed, about 6 in. long, $\frac{3}{4}$–1 in. broad, falcately curved, on stipes of about 1 in., the valves smooth and faintly or not at all depressed between the seeds.

Upper Guinea. Island of St. Thomas, *Dr. Welwitsch! Mann!*

3. **P. filicoidea,** *Welw. mss.* Trees of 40–50 ft.; leafless or with young leaves only at the time of flowering. Leaves 1–$1\frac{1}{2}$ ft. long by $\frac{3}{4}$–1 ft. broad; pinnæ approximated in about 6–9 pairs, each with 16–24 pairs of opposite or alternate oblong obtuse more or less distinctly triplinerved leaflets, the upper lateral nervure looping and often evanescent, glabrous or at first minutely pubescent on the margin, $\frac{1}{2}$–1 in. long or slightly longer, 2–$3\frac{1}{2}$ lines broad; rachis usually puberulous with sessile glands at the base of the upper pinnæ and sometimes between the pairs of leaflets. Flowers red or scarlet in clavate heads as in the preceding species. Calyx $\frac{1}{2}$ in. long. Legume smooth, compressed, though not so much as in the other African species, or scarcely subterete, 10–18 in. long, $\frac{3}{4}$ in. broad, on stipes of 2 in. more or less.

Upper Guinea. Niger Expedition, *Barter!*
Lower Guinea. Angola, prov. Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Shire valley, Zambesi land, *Dr. Kirk!*
The mealy contents of the legumes are eaten, and the crushed seeds are used in native cookery.

3. **ENTADA,** Adans.; Benth. et Hook. f. Gen. Plant. i. 589.

Flowers spicate, 5-merous, sessile or shortly pedicellate. Calyx campanulate, toothed or deltoid-lobate. Petals free or coherent at base, oblong-lanceolate or linear, valvate. Stamens 10, usually exserted; anthers elliptical or roundish with a terminal caducous gland; pollen-grains indefinite. Ovary subsessile or shortly stipitate, multiovulate; style filiform; stigma terminal, truncate, concave. Legume straight or arcuate, sometimes of enormous size, woody, coriaceous or papery; sutures more or less thickened, persisting after the separation of the 1-seeded articles as a replum. Seeds flattened, exalbuminous; testa with a central areole.—Trees or climbing shrubs, unarmed in the African species. Leaves bipinnate; number of pinnæ and of leaflets very variable. Spikes solitary or fascicled from the upper axils, or panicled at the extremities; hermaphrodite or polygamous.

Excepting *E. scandens*, the following species appear to be confined to Africa. *Entada* differs from *Elephantorrhiza* only in the legume-valves breaking up into articles.

Pinnæ usually 2-jugate.
- Leaflets 2–5-jugate falcate elliptical 1½–3 in. long. Spikes axillary solitary ½–1 ft. Legume very large . . . . . 1. *E. scandens.*
- Leaflets 4–18-jugate, linear-oblong, ⅓–1 in. long. Spikes solitary or distichously panicled, 1½–2½ in. Legume flat arcuate, 4–6 in. in chord . . . . . 2. *E. Wahlbergii.*
- Leaflets 8–15-jugate, linear-oblong, ⅓–½ in. long. Spikes axillary fascicled. Legume 10–15 in. long, 3–4½ in. broad . . . . 3. *E. africana.*

Pinnæ 3–∞-jugate. (See *E. africana.*)
- Pinnæ 5–8-jugate. Leaflets 14–20-jugate, ½–1 in. long. Articles 2–2½ times broader than long . . . . . 4. *E. sudanica.*
- Pinnæ 14–18-jugate. Leaflets 25–50-jugate, ¼–½ in. long. Articles 2½–4 times broader than long . . . . . 5. *E. abyssinica.*

1. **E. scandens,** *Benth. in Hook. Journ. Bot.* iv. 1842, 332. A widely spreading shrub with slender longitudinally striate glabrous glaucescent extremities. Leaves glabrous or the rachis faintly pubescent on the upper surface, 1½–3 in. to the upper pinnæ, usually produced as a simple or branching slender tendril. Pinnæ 2-jugate; leaflets 2–5-jugate, the upper usually larger and more oblique, falcate obliquely elliptic-oblong or varying from ovate to obovate, obtuse and more or less distinctly emarginate; petiolules ½ line or less; upper leaflets 1½–3 in. long, ¾–1⅓ in. broad. Stipules narrow-linear or subulate, 2–3 lines long. Spikes solitary, axillary, straight or curving, with the peduncle ½–1 ft. long, rachis pubescent with subulate bracts present at flowering. Flowers polygamous or unisexual by abortion, yellowish-white, 2–3 lines long, subsessile or pedicels very short. Calyx 5-toothed. Stamens much exserted. Ovary rudimentary in the staminate flowers. Legume woody, very large, often twisted, 2–4 ft. long, 3–4 in. broad.—*Mimosa scandens*, L.; *Entada Pursætha*, DC. Prod. ii. 425 (*fide Bentham*, whose memoir, cited above, see for further synonymy).

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot!* (*E scandens*, β. *Heudelotiana*, Baill. in Adans. vi. 209); Fernando Po, *Mann!*

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

Dr. Welwitsch states that one of his negroes, from Cabinda, named the plant in Angola *Entada*. A pod is in the Kew Museum, presented by Sir George Grey, and indistinctly labelled as from Lake Ngami. It is probably widely spread in Africa, as in Tropical Asia.

It affords a fibre used for textile purposes. (*Dr. Welwitsch.*)

2. **E. Wahlbergii,** *Harv. Flora Cap.* ii. 277. A slender climber, wholly glabrous. Extremities terete faintly sulcate or striate. Pinnæ 2-jugate; rachis 1½–4 in. long, spreading or deflexed, ecirrhose in our specimens; leaflets in 4–10–18 pairs, sessile, linear-oblong, obtuse, scarcely mucronulate, very oblique at the obtuse or truncate base, the nervure becoming median towards the apex, ⅓–1 in. long, 1–3 lines broad. Flowers chocolate-red or brown, in dense cylindrical shortly pedunculate spikes 1½–2½ in. long; pedicels not exceeding 1 line, often much shorter. Racemes solitary from the upper axils or distichously panicled and patent from a zigzag rachis at the extremities. Bracts and bracteoles subulate, present at flowering. Calyx-lobes acute, deltoid. Petals spreading or recurved, confluent at the base with the filaments and disk. Legume flat, arcuate, 4–6 in. from end to end of the chord, 1–1½ in. broad or about ⅙ less at the constrictions, which are faint on the dorsal and rather deep on the ventral suture; larger pods with 10–13 articles each, varying from as broad to twice as broad as long. Pericarp very thin, faintly reticulate, the endocarp apparently not separable. Gynophore ½ in. or less.

Upper Guinea. Leaflets 12–16 pairs, ½ in. long or less; flowers nearly sessile, the stamens shorter than or barely exceeding the petals. Niger, *Barter!*

Mozamb. Distr. Leaflets ¾–1 in. long, often in few pairs. Rovuma river, *Dr. Meller!*

In the Natal plant, originally described by Dr. Harvey, the flowers are on distinct though short pedicels, and the stamens are more exserted. We have flowering and fruiting specimens both from Natal and the Niger, and I can hardly doubt their specific identity.

3. **E. africana,** *Guill. et Perr. Fl. Seneg.* i. 233. A much-branched tree of 15–30 ft.; extremities shortly pubescent. Pinnæ 2–4-jugate; leaflets 8–15-jugate, linear-oblong, obtuse or emarginate, paler beneath with a few scattered hairs, 4–5 lines long, ½ line (? 1–2 lines) broad. Spikes in fascicles of 2–4, supra-axillary, elongate, erect. Calyx turbinate, 5-dentate. Ovary glabrous. Legume compressed, chartaceous, oblong, subarcuate, with from 15–20 1-seeded articles.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot and Perrottet.* Niger, *Barter!* Fernando Po, *Mann!*

I have not seen an authentic specimen, and the description is taken from Guillemin and Perrottet. The plants collected by Barter and Mann are in fruit only, but I can hardly doubt that they belong to this species. The pods do not exceed 15 in. in length, are irregularly or obscurely sinuous, flat, 3–4½ in. broad; the epicarp is papery, smooth, and very obscurely transversely veined. Guillemin and Perrottet describe the pod as 8 in. *broad*, meaning no doubt 8 in. long.

Nearly allied to *E. africana* is a plant of Zambesi land, of which we have fruiting specimens only, gathered near Senna, on the Zambesi, by Dr. Kirk. It is a glabrous climber (occurring from the coast to Tette). Pinnæ about 4-jugate; leaflets 10–12-jugate, rather broadly oblong obtuse sessile, 7–9 lines long, 3 lines broad. Flowers

(according to Dr. K.) white in dense spikes. Legume 1⅓–2 ft. long, 3–3½ in. broad, the articles much broader than long, the epicarp separable and papery towards the replum, much thickened cellular and prominently convex externally in the centre over the compressed seed, which is about ½ in. in diameter, with a distinct central areole. As the remarkable thickening of the pericarp in the centre of the articles appears to afford a marked specific distinction, this plant may be called *E. Kirkii*.

4. **E. sudanica,** *Schweinf. Reliq. Kotsch.* 8, t. viii. A small tree or shrub with terete glabrous pruinose or glaucescent extremities. Leaves 1 ft. long more or less, pinnæ 5–8-jugate; leaflets subsessile, 14–20-jugate, oblong obtuse or obscurely emarginate, scarcely mucronulate, wholly glabrous or thinly pubescent on both surfaces, ½–1 in. long, 2–4 lines broad. Spikes cylindrical, dense, usually 3 or 4 together, shortly supra-axillary, erect, 2½ to nearly 6 in. long. Bracts 0 at flowering. Flowers glabrous, white or yellowish, with the short pedicel 2–3 lines long. Calyx-teeth broadly deltoid. Stamens exserted; filaments confluent at base with the petals and disk. Ovary glabrous. Legume straight or nearly so, 8–15 in. long, distinctly and almost equally constricted on both sutures, 1½–2 in. broad at the constrictions; articles 12–15, 2–2½ times broader than long, the thin chartaceous endocarp at length separating; epicarp almost nerveless outside, coarsely reticulate within, especially under the central seed-covering disk. Seeds elliptical, ½ in. in diameter, more or less.

Upper Guinea. Nupe, Niger, *Barter!* who also gathered a form with leaflets 1 in. long at the same locality.

Nile Land. Gallabat, *Schweinfurth!* Fesoghlu, *Cienkowsky.*

Mozamb. Distr. A variety with puberulous spikes, described as a "scrambling bush growing in sand," Kongone mouth of the Zambesi, *Dr. Kirk!*

5. **E. abyssinica,** *Steud.*; *Rich. Fl. Abyss.* i. 234. A small widely spreading tree occasionally attaining 30 ft.; extremities terete, glabrous, sometimes glaucescent. Leaves 6–15 in. long; pinnæ 14–18-jugate, rachis glabrous or pubescent on the upper surface; leaflets 25–50-jugate, linear obtuse mucronulate, glabrous or at first with scattered microscopic hairs, the single nerve very oblique towards the base; 3–5 lines long. Spikes erect or ascending, solitary or 3 or 4 together, from a little above the axil of the upper leaves or collected in terminal panicles usually overtopped by the leaves; rachis of spike pubescent 3–6 in. long; bracts 0 at flowering. Flowers dense, glabrous or nearly so, yellowish, with the very short pedicel about 2 lines long. Calyx-teeth short, broadly deltoid. Stamens distinctly exserted; filaments confluent at base with the petals and disk. Ovary glabrous. Legume straight or but slightly curved, flat, from 6 in. to a little over 1 ft. in length, 1½–2 in. broad, rarely broader; constriction between the articles obscure, rarely very marked; epicarp papery, at length separating from the thin endocarp. Articles ¼ to nearly ½ as long as broad. Seed compressed, ovate-elliptical or roundish, nearly ½ in. in greatest diameter, with a broad areole.

Nile Land. (I have not seen flowers of this plant, nor does Richard describe the inflorescence.) Abyssinia, *Dillon! Schimper!*

Lower Guinea. Angola, Golungo Alto and Huilla, *Dr. Welwitsch!* Var. *microphylla*, Golungo Alto, *Dr. Welwitsch!*

M. Baillon (Adansonia, vi. 208–10) refers with doubt to this genus the following species of which fruits are unknown. I have not matched his descriptions with any specimens at Kew.

E.? durissima, Baill. A tree 30–40 ft. Leaves bijugate, with about 9 pairs of elliptic-oblong leaflets to each pinna, leaflets ¾ in. long, 4–5 lines broad. Spikes 2–3 times shorter than the leaves. Calyx 5-fid, pubescent. Anther-cells divergent above. Ovary densely villous, with a short style.

Senegambia, *Heudelot and Perrottet.*

E.? Duparquetiana, Baill. Tree. Leaves bijugate, each pinna with a single pair of ovate acute leaflets, about 3 in. long by 1–1¼ in. broad. Flowers sessile in slender geminate spikes twice as long as the leaves. Calyx 5-dentate. Petals connate below. Stamens much exserted. Gaboon river, *M. Duparquet.*

Specimens in flower, without leaf or pod, are in the Kew Herbarium, from Zomba near Lake Shirwa, Zambesi land, collected by Dr. Meller. They may belong to a new species. The spikes of (yellow) flowers are wholly glabrous, 5–9 lines long, and occasionally collected in fascicles of 10–15 or more, sometimes solitary. The flowers are shortly pedicellate, the pedicel separating by articulation a minute interval from the rachis. Calyx-lobes deltoid. Ovary subsessile-glabrous.

Dr. C. Bolle, in Dr. Peters' Mossamb. Bot. 9, describes a new *Elephantorrhiza* (*E. Petersiana*) from the Zambesi. As no fruit has been seen of the plant, it must remain a doubtful member of this genus, which only differs from *Entada* in the continuous valves of the legume, which separate each from the replum in one piece and not in 1-seeded articles. I have not seen a specimen. All the specimens of *Elephantorrhiza* in the Kew Herbarium are from South extra-Tropical Africa.

4. **PIPTADENIA**, Benth.; Benth. et Hook. f. Gen. Plant. i. 589.

Flowers 5-merous, sessile or shortly pedicellate. Calyx campanulate, free, toothed or lobed. Petals oval or oblong, free to the disk (in Trop. African species), valvate. Stamens 10, free, exserted; filaments consolidated at base with the disk and base of the petals; anthers small, roundish, with a large caducous apical gland; pollen-granules ∞. Ovary subsessile, with several or indefinite ovules. Legume shortly stipitate, flat, coriaceous, 2-valved, valves continuous, entire. Seeds compressed (winged in *P. africana*).—Trees or shrubs, unarmed (or aculeate. Leaves bipinnate; leaflets small, numerous; rachis with or without glands. Flowers small, white or greenish-yellow, hermaphrodite or polygamous, spicate in the following species; spikes panicled from the upper axils.

A considerable genus in Tropical America. The following species appear peculiar to Africa.

Pinnæ alternate 10–13 on each side, leaflets ¼ in. or less, 30–60-jugate	1. *P. africana.*
Pinnæ 4–6-jugate, leaflets 8–13-jugate	2. *P.? Mannii.*

1. **P. africana,** *Hook. f. Fl. Nigrit.* 330. A tree of 15–30 ft. or more with a widely spreading crown; branches unarmed, early glabrous. Leaves ½ ft. long more or less (3–7 in.), rachis puberulous eglandular; pinnæ alternate, usually 10–13 on each side; leaflets opposite, multi-

(30–60) jugate, closely distichous, sessile, linear-oblong, more or less falcate, obtuse or subacute, glabrous or nearly so, venation obscure, 2–3 lines long, about $\frac{1}{2}$ line broad. Spikes $2\frac{1}{2}$–4 in. long, in axillary and terminal panicles usually exceeding the leaves; peduncles rusty-pubescent or puberulous, bracts 0 at flowering. Flowers whitish or greenish-yellow, about 2 lines long, minutely pedicellate, pedicel articulated, the microscopic base persisting after the fall of the flower. Calyx cupuliform, 5-dentate. Petals linear-oval, acute. Stamens exserted, filaments filiform, consolidated at base with the disk and petals; anther-gland large, caducous. Ovary glabrous, subsessile. Style at length as long as ovary. Legume 1 ft. long more or less, 1–$1\frac{1}{4}$ in. broad, flat, straight, coriaceous, smooth, obscurely veined, continuous, the valves often cohering by the dorsal suture after dehiscence. Seed compressed with a membranous laterally dilated wing as broad as the valve.

Upper Guinea. On the Niger, *T. Vogel! Ansell!*
Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*
The description of the fruit is from Dr. Welwitsch's specimens, which agree as to flower and foliage with the type-specimens from the Niger.

2. **P? Mannii,** *Oliv.* A shrub attaining 15 ft. with terete, smooth, glabrous, dark, subglaucous branches. Leaves 6–9 in., glabrous excepting the upper side of the rachis and under surface of the leaflets, which are thinly scattered with microscopic hairs; pinnæ opposite 4–6-jugate; leaflets subsessile, 8–13-jugate, elliptic-oblong, obtuse, slightly oblique at base, the midrib nearly central, $\frac{1}{2}$ in. long more or less, 2–3 lines broad. Spikes 2–5 in. long, in panicles from the upper axils, sometimes 1 ft. or more in length; rachis of the spike puberulous, rough with the minute persistent bases of the short pedicels of the fallen flowers. Bracts 0 at flowering. Flowers about 2 lines long, "white." Calyx-lobes short, deltoid. Petals oblong, rather acute. Stamens much exserted, filaments filiform, slightly thicker above the middle. Ovary glabrous, subsessile. Fruit not seen.

Upper Guinea. Fernando Po, *Mann!*

5. **ADENANTHERA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 590.

Flowers 5-merous, distinctly pedicellate. Calyx campanulate, 5-toothed. Petals valvate, coherent below or free. Stamens 10, free; anthers with a deciduous apical gland; "pollen-grains ∞." Ovary sessile, multiovulate. Legume linear, compressed or turgid over the seeds, usually incurved or falcate, 2-valved; valves coriaceous, entire. Seeds thick, testa hard, smooth, scarlet or orange and black; embryo partially invested by a thin pellucid layer of albumen.—Unarmed trees. Leaves bipinnate; leaflets alternate or subopposite, numerous. Racemes often elongate, solitary or fascicled in the axils or panicled at the extremities. Flowers white or yellowish.

A small genus of Tropical Asia, of which one species, with long curved or twisted legumes, the endocarp when dry pale straw-coloured with a satiny sheen and brilliantly scarlet seeds (*A. pavonina*, L.), has been introduced into the New World, and is doubt-

less met with here and there on the African coast, although I have not seen specimens from thence. M. Baillon says it is found on the Gaboon river (Adans. vi. 207). In the Kew Herbarium there is an imperfect specimen collected by Dr. Meller on the Rovuma river in young fruit, which may belong to this genus. The legumes are very narrow, and about 2 ft. in length. Leaflets, from their scars, subopposite, ovate-lanceolate, narrowed to an obtuse or minutely emarginate apex, entire, glabrous, reticulate above, 2 to nearly 3 in. long, 1 in., more or less, broad, on petiolules of 1–2 lines.

6. **TETRAPLEURA**, Benth.; Benth. et Hook. f. Gen. Plant. i. 590.

Flowers 5-merous, shortly pedicellate. Calyx 5-toothed. Petals linear-lanceolate. Stamens 10, filaments filiform, exceeding the petals; anthers ovate, with an apical globose gland. Ovary oblong; style equalling the stamens. Legume indehiscent, straight, oblong, tetragonous or stoutly tetrapterous, the face of each woody valve bearing a longitudinal prominent thick wing or keel (in *T. Thonningii*). Seeds transverse, embedded in distinct cavities, compressed, smooth, with a central areole; testa thick; embryo with a thin lateral layer of albumen. —Tall unarmed trees. Leaves alternate (not opposite as described, through some mistake, in Schum. et Thonn. Guin. Pl. 213), bipinnate. Flowers small, in spiciform racemes.

Confined to Tropical Africa. The genus is very imperfectly known. It probably includes three or four species. The description of the flower given above is from Schum. et Thonn. (l.c.)

Legume 6–10 in., apex rounded, acutely and broadly tetrapterous. Pinnæ 5–8 pairs, leaflets subsessile	1. *T. Thonningii.*
Legume 4–5 in., pointed, narrowly tetrapterous. Pinnæ 3–4 pairs, leaflets distinctly petiolulate	2. *T. andongensis.*
Legume, clavate-tetragonous, obtusely apiculate	3. *T. obtusangula.*

1. **T. Thonningii,** *Benth. in Hook. Journ. Bot.* iv. 1842, 345. Large tree, with terete glabrous extremities. Leaves alternate; pinnæ in about 5–8 pairs, opposite or rarely alternate; leaflets alternate or subopposite, 20 more or fewer to each pinna, broadly oblong or elliptical-oblong, very obtuse or emarginate, rather coriaceous, glabrous or faintly pubescent on the midrib below, venation obscure, 5–7 lines long, 3–4½ lines broad, subsessile. Legume 6–10 in. long, about 1½ in. broad, rounded at the apex, each valve with a narrow longitudinal crest ¾–1¼ in. high, of the same texture as the pericarp from end to end, thus sharply tetrapterous in transverse section. Seeds about the size of those of the Tamarind. — *Adenanthera tetraptera*, Schum. et Thonn. Guin. Pl. 213.

Upper Guinea. Aquapim, *Thonning!*
Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!* (fruit only).

The fruit is sold in the Sierra Leone market "for washing," and specimens are in the Kew Museum from two or three different localities in Upper Guinea, so that the tree has probably a wide distribution.

In Dr. Welwitsch's collection I have only seen the fruit. Through the courtesy of Professor Lange I have been favoured with a sight of Thonning's specimen preserved at Copenhagen. It is in leaf only with a young detached legume. A pen-sketch is appended to the inflorescence, representing a dense spike 1½ in. long, of very small flowers.

2. **T. andongensis,** *Welw. mss.* Tree of 15–25 ft. or more; extremities terete, glabrous, the epiderm early splitting longitudinally. Leaves 6–10 in. long, wholly glabrous; pinnæ in 3 or 4 pairs, occasionally alternate; leaflets about 14–16 to each pinna, usually alternate, distinctly petiolulate, elliptical or ovate-elliptical, very obtuse entire or retuse at the apex, venation very obscure, 6–9 lines long, ⅓–½ in. broad, petiolule 1 line or less. Flowers not seen. Legume 4–5 in. long, 1 in. broad, pointed, each valve with a narrow coriaceous longitudinal wing about ¼–⅓ in. high.

Lower Guinea. Angola, Pungo Andongo, *Dr. Welwitsch!*

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3. Besides the above, Dr. Welwitsch collected in Golungo Alto specimens of the fruit of probably a third species of *Tetrapleura* (*T. obtusangula*, Welw. mss.) The legume is about 4 in. long, clavate-tetragonous, obtusely apiculate and obtusely rhomboidal in transverse section. It was borne by a tree of 25–30 ft., the leaves of which Dr. Welwitsch was unable to collect.

Possibly to the same species may belong fruits in the Kew Museum, collected in South Central Africa by Dr. Kirk. These are nearly 6 in. in length, and less distinctly clavate. Shorter legumes 3½–4 in. long, obtuse and apiculate, curved or straight, intermediate in transverse section between the tetragonous fruit of *T. obtusangula* and the tetrapterous fruit of *T. Thonningii*, were also collected by the same naturalist on the Rovuma river.

7. **PROSOPIS,** Linn.; Benth. et Hook. f. Gen. Pl. i. 591.

Flowers 5-merous, sessile or subsessile. Calyx 5-toothed or 5-fid. Petals free (or connate below), oval, valvate, at the base very shortly consolidated with the disk and base of the filaments. Stamens 10, free, exserted; anthers obovate-rotundate, with a sessile incurved or anticous gland between the divergent apices of the cells (in *P. oblonga*). Ovary subsessile, oblong, multiovulate; style slender, stigma terminal, minute, concave. Legume in *P. oblonga* (§ *Anonychium*) usually straight, subterete, with a thick hard pericarp transversely septate between the albuminous seeds; in *P.? Kirkii* (§ *Circinaria*) compressed, circinate, with exalbuminous seeds.—Trees, armed or unarmed. Leaves bipinnate, leaflets firm or subrigid. Stipules 0 or inconspicuous. Flowers small, in dense axillary spikes.

Most of the species are American. The Tropical African species are peculiar to this Flora.

Pinnæ 2–3-jugate.	Legume subterete straight	1. *P. oblonga.*
Pinnæ 6–7-jugate.	Legume flat circinate	2. *P. Kirkii.*

1. **P. oblonga,** *Benth. in Hook. Journ. Bot.* iv. 1842, 348. A hard-wooded tree occasionally attaining 70 ft.; extremities unarmed, subterete, striate or slightly furrowed, puberulous. Leaves bipinnate, 5–8 in., rachis terete, puberulous; pinnæ 2–3-jugate with a sessile gland between each pair; leaflets usually 5–11-jugate, elliptic-oblong oval or lanceolate, subacute, usually mucronate, thinly or obsoletely puberulous or pubescent, oblique-based, subsessile, ⅔–1 in. long, ¼–⅓ in. broad. Flowers white or greenish yellow in solitary axillary shortly pedunculate dense spikes 1½–2½ in. long. Calyx minute, 5-fid, with

deltoid lobes. Petals oval, acute, glabrous. Stamens exserted; anthers broadly obovate-rotundate with a sessile non-exserted triangular gland between the slightly divergent apices of the cells. Ovary and style laxly patent-pilose. Legume 4–6 in. long, 1 in. in diameter, subcylindrical or but slightly compressed, straight, obtuse, smooth with a thick woody pericarp thinly septate between the transverse seeds. Seeds oblong or ellipsoidal, shining, with a faint areole on each side; embryo between thick lateral layers of albumen.—*P. lanceolata*, Benth. l.c.; *Anonychium lanceolatum*, Schweinf. Reliq. Kotsch. 7, t. vii.; *Coulteria? africana*, Guill. et Perr. Fl. Seneg. i. 256 (ex descr.).

Upper Guinea. Senegambia, *Heudelot!* (*form with elliptic-oblong rather obtuse leaflets*); Niger, *Barter!*

Nile Land. Kordofan, *Kotschy!*

Prosopis? dubia, Guill. et Perr. Fl. Seneg. i. 242, is referred in "Niger Flora" to *Acacia*. I do not know it. It is described as a tree of 40 ft., with virgate glabrous branches, geminate straight stout stipular spines; pinnæ 15–20-jugate, leaflets multijugate linear obtuse, 1½ lines long. Legume linear compressed coriaceous 10–12-seeded.

2. **P.? Kirkii,** *Oliv.* A large tree; extremities unarmed, glabrous or obsolete-puberulous, slightly furrowed when dry, with pale ashen bark. Pinnæ 6–7-jugate, with a sessile gland between the pinnæ, rachis puberulous above. Leaflets 10–17-jugate, subsessile, oblong, obtuse, minutely pubescent, ¼–⅓ in. long, 1 line, more or less, broad. Flowers in solitary axillary spikes 4–6 in. long (apparently insect-punctured in our specimens). Legume 5–8 in. long, 1 in. broad, flat, coriaceous, circinate, with a short hooked apiculus. Seeds compressed, ovate, with a shining testa and faint areole on each side, separated by narrow interposed cellular partitions of the endocarp. Albumen 0.

Mozamb. Distr. Shire river, Zambesi land, *Dr. Kirk!*

8. **DICHROSTACHYS,** DC.; Benth. et Hook. f. Gen. Plant. i. 592.

Flowers sessile, 5-merous, in dense cylindrical spikes, the upper hermaphrodite, the lower neuter with long much exserted filiform staminodes. Calyx shortly toothed. Petals valvate, more or less connate. Stamens 10, hypogynous, free, exserted; anther oblong or elliptical with a globose caducous often slenderly stipitate apical gland; "pollen-grains ∞." Ovary subsessile, multiovulate; style slender, stigma terminal, minute. Legume linear, compressed, coriaceous, twisted, indehiscent or irregularly opening; valves continuous, usually depressed between the seeds. Seeds compressed, shining; embryo between thin lateral layers of pellucid albumen.—Shrubs or small trees, usually spinescent. Leaves bipinnate, leaflets numerous, usually small, sessile. Spikes axillary, pedunculate, usually geminate or solitary; hermaphrodite flowers yellow; neuter pink, white or purplish.

A small genus of the Tropics and Australia. The following species are endemic, though *D. nutans* is widely dispersed between the Tropics in Africa.

Legume ¼–⅓ in. broad. Pinnæ usually 5–10-jugate	1. *D. nutans*.
Legume ¾–1½ in. broad. Pinnæ 10–18-jugate	2. *D. platycarpa*.

1. **D. nutans,** *Benth. in Hook. Journ. Bot.* iv. 1842, 353. Shrub or small tree; extremities terete, glabrous or pubescent, usually armed with acute spreading axillary spines. Leaves glabrous or pubescent; pinnæ 5–10-jugate, occasionally more numerous, with a stipitate gland between each pair; leaflets sessile, linear or linear-oblong, obtuse or broadly pointed, sometimes mucronulate, usually in from 12–22 pairs; 1½–4 lines, rarely 5–6 lines long. Flowers in dense axillary geminate or solitary pedunculate obtuse spikes, together with the peduncle 1½–3 in. long; the hermaphrodite flowers yellow, the lower neuter "pink." Bracts linear, concave or hooded above, rather shorter than the 5–6-nerved and -toothed calyx. Petals coherent ⅔ or ¾ of their length. Ovary laxly pilose, style slender, glabrous. Legume contorted, glabrous or thinly pubescent, varying from ¼–⅓ in. in breadth; valves depressed and subcoherent between the seeds.—*Caillea dichrostachys*, Guill. et Perr. Fl. Seneg. i. 240. *Mimosa bicolor*, Schum. et Thonn. Guin. Pl. 326. *Desmanthus nutans*, DC. Prod. ii. 446. *D. trichostachys* and *D. leptostachys*, DC. l.c., *D. divergens*, Willd., DC. l.c.; *Mimosa sanguinea*, Bruce, Trav. vii. 147. *Acacia spinosa*, E. Mey. Comm. Pl. Afr. Austr. i. 170 (Benth. in Hook. Journ. l.c. and Lond. Journ. Bot. v. 1846, 83.)

Upper Guinea. Sierra Leone! Senegambia! Niger land! *Various Collectors.*

Nile Land. Abyssinia, *Schimper!* Nubia, *Speke and Grant!* (A rigid divaricately-branched form from a dry station.) Adir, *Petherick!*

Lower Guinea. Angola, various provinces, *Dr. Welwitsch!* Congo, *Burton!* "Benguela," *Curror!* Var. *setulosa*, Welw. mss. Pinnæ 10–13 pairs or more, leaflets very small with a setulose tip, Huilla, *Dr. Welwitsch!*

South Central. Lake Ngami, *M'Cabe!*

Mozamb. Distr. Zambesi land and Rovuma river, *Dr. Kirk!* Rumuma, Zanguebar, *Speke and Grant!*

Figured in Bruce's Abyssinian "Travels" as "*Ergett Dimmo*" (vol. vii. No. 6).

Dichrostachys Forbesii, Benth. (l.c.), from Delagoa Bay, is nearly allied to the above, differing in the fewer pinnæ of the leaves and one or two other characters of doubtful constancy.

2. **D. platycarpa,** *Welwitsch Apont.* 576. A small slender spinose tree of 10–15 ft.; extremities pubescent at first. Pinnæ 10–18-jugate, with a stipitate gland between at least the upper pinnæ; leaflets as in *D. nutans*, 1–2 lines long, scarcely exceeding ¼ in. in breadth. Spikes usually shorter than the leaves. Legume contorted, 2–4 in. long, ¾–1¼ in. broad.

Upper Guinea. Bagroo river, *Mann!*

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

Dr. Bolle, in Peters' Mossamb. Bot. pp. 9, 10, cites both *Dichrostachys tenuifolia*, Benth., and *D. cinerea*, W. and A., as occurring in Zambesi land. The former species was first described from Madagascar specimens, while *D. cinerea* is Indian. I fear, however, that sufficient allowance has not been made for the great variability of *D. nutans*, and as I do not find specimens in Dr. Kirk's rich collections which I should refer to either of these in preference to *D. nutans*, I prefer to await further information before admitting them. I doubt if *D. nutans* be really distinct from *D. cinerea*.

9. **NEPTUNIA,** Lour.; Benth. et Hook. f. Gen. Plant. i. 592.

Flowers 5-merous, capitate, sessile, the upper hermaphrodite, the lower neuter. Calyx 5-toothed. Petals free or cohering, "valvate."

Stamens 10 (or 5), free, exserted; anther with a deciduous "stipitate gland," pollen-grains ∞ ? "Ovary stipitate, multiovulate; style filiform, with a small terminal concave stigma." Legume shortly and broadly oblong, oblique and almost at right angles with the short stipes, apex rounded with a distinct apiculus, compressed, thinly coriaceous or submembranous, 2-valved, valves depressed between the seeds. Seeds transverse, oblong or ovate, compressed, with a slender funicle; embryo between thin lateral layers of albumen.—Unarmed herbs or low undershrubs, aquatic in the only African species. Leaves bipinnate, multifoliolate. Peduncles axillary, solitary, elongate; flowers capitate.

A small genus common to both hemispheres, with the species (the following) widely diffused in tropical waters.

1. **N. oleracea**, *Lour.*; *Benth. in Hook. Journ. Bot.* iv. 1842, 354. Aquatic often floating glabrous herbs, with copiously rooting diffuse or prostrate branches. Leaves sensitive; pinnæ 2–3-jugate; leaflets 8–20-jugate, obtuse or broadly pointed, base very oblique, subsessile, usually $\frac{1}{4}$–$\frac{1}{2}$ in. long. Stipules semicordate, membranous. Petiolar glands apparently wanting. Peduncles usually from 2 or 3–8 in. Petals oval or oval-spathulate, free. Stamens 10. Staminodes of neuter flowers compressed. Legume about 1 in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. broad. Seeds 4–8. —*N. stolonifera*, Guill. et Perr. Fl. Seneg. i. 239. *Desmanthus natans*, Willd., DC. Prod. ii. 444. *D. lacustris*, Willd., and *D. stolonifer*, DC. l. c. (Synonymy from Mr. Bentham's memoir.)

Upper Guinea. Senegambia (*Guill. et Perr.*).
Nile Land. Kordofan, *Kotschy!* White Nile, *Petherick!*
Lower Guinea. Angola? a portion of a leafy shrub only, *Dr. Welwitsch!*
Mozamb. Distr. Shire river, Zambesi land, *Dr. Kirk!*

10. DESMANTHUS, Willd.; Benth. et Hook. f. Gen. Plant. i. 592.

Flowers sessile in small pedunculate heads, 5-merous, hermaphrodite or the lower ones imperfect. Calyx campanulate, toothed. Petals free (or slightly cohering), valvate. Stamens 10 or 5 free, exserted; anther oblong, eglandular, "pollen-grains ∞." Ovary sessile or nearly so, glabrous, multiovulate; style filiform; stigma terminal, truncate, concave. Legume narrow-linear, straight (or falcate), pointed, compressed, thinly coriaceous, 2-valved; valves depressed obliquely between the seeds. Seeds compressed, subrhomboidal, with an oblong-hippocrepiform areole; embryo within lateral layers of dark subtranslucent albumen.—Herbs or undershrubs, unarmed. Leaves bipinnate, leaflets small; stipules setaceous, persistent. Flower-heads small, whitish, pedunculate, axillary, solitary.

A small American genus, with one species (the following) widely scattered in cultivated places between the Tropics in the Old World.

* 1. **D. virgatus,** *Willd.*; *DC. Prod.* ii. 445. Shrub with slender erect or ascending branches, angular owing to three prominent decur-

rent lines from each leaf; attaining 2 or 3 ft. in height. Pinnæ usually in 2–4 pairs; rachis with an oblong sessile gland below the lowest pair; leaflets "sensitive," in 10–20 pairs, linear-oblong, subapiculate, base obliquely truncate, sessile, $1\frac{1}{2}$–3 lines long. Legume usually straight, 2–$3\frac{1}{2}$ in. long, $1\frac{1}{2}$–3 lines broad.

The only Tropical African specimens which I have seen are in Dr. Welwitsch's herbarium, collected in Ambriz (Congo), where the plant occurs sporadically amongst cultivated *Amaranthaceæ*.

11. **MIMOSA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 593.

Flowers small, capitate (or spicate), 4–5-merous. Calyx minute, campanulate, dentate or irregularly laciniate with setaceous segments. Petals connate more or less or nearly free, valvate. Stamens (as many as or) twice as many as petals, free, exserted; anthers small, eglandular; "pollen-grains indefinite." Legume oblong or linear, usually flat, valves separating entire or in transverse articles from the persistent sutural replum. . . . .—Herbs, shrubs or trees, sometimes scandent, aculeate or unarmed. Leaves bipinnate, often sensitive; petiolar glands rarely present. Pedunculate heads (or spikes) axillary or racemose towards the extremities, solitary or fascicled.

A very large chiefly Tropical American genus, with few outliers in the Old World. Of the following, *M. asperata* is a common species in both hemispheres, *M. violacea* restricted to Eastern Africa.

Legume densely hispid. Calyx setaceous-laciniate. Leaflets 25–40-jugate	1. *M. asperata.*
Legume glabrous. Calyx campanulate, denticulate. Leaflets 8–12-jugate	2. *M. violacea.*

1. **M. asperata,** *Linn.; Benth. in Hook. Journ. Bot.* iv. 1842, 400. A much branched prickly and coarsely setulose-pubescent hirsute or strigillose shrub, often attaining several feet. Prickles sharply pointed, straight, or reflexed from a vertically dilated base. Leaves strigose hispid or pilose, usually with slender prickles between the subopposite pinnæ; pinnæ usually from 7–16 pairs; leaflets crowded, usually 25–40-jugate, linear, more or less acute, strigose strigose-ciliate or glabrate, usually from $1\frac{1}{2}$–4 lines long. Peduncles axillary, at length stout, $\frac{1}{2}$–$1\frac{1}{2}$ in. long, solitary or towards the ends of the branches 2 or 3 from each axil. Capitula whitish rose or purple. Flowers 4-merous. Calyx minute, irregularly laciniate with setaceous teeth. Legume oblong or linear-oblong, straight or falcate, compressed, densely strigose-hirsute, apex rounded usually tipped with the remains of the style; valves breaking up into numerous narrow transverse articles, which separate from the slender sutural replum; $1\frac{1}{2}$–3 in. long, $\frac{1}{2}$ in. broad, on a stipes of 1–3 lines or sessile. —*M. polyacantha,* Willd.; DC. Prod. ii. 428; *M. procumbens,* Schum. et Thonn. Pl. Guin. 324; *Ergett el Krone,* Bruce, Abyss. vii. t. 7. (For further synonymy see Bentham l. c.)

Very abundant and widely spread through Tropical Africa. "South Central" is the only division of the Continent unrepresented by specimens in the Kew Herbarium. It affects watery places. In Angola Dr. Welwitsch describes it as forming dense thickets penetrable only by beasts of prey.

2. **M. violacea,** *Bolle in Peters' Mossamb. Bot.* 8. A spreading interlacing shrub with very slender sharply shortly aculeate puberulous branches; prickles recurved. Leaves 4–6 in. long, rachis aculeate, pinnæ subdistant, 5–15-jugate, 1 in. long more or less, leaflets oblong, mucronulate, glabrous, 1½–3 lines long, in 8–12 pairs. Peduncles axillary, solitary or 2 or 3 together, ½–1 in. long, at first very slender. Flowers fragrant, "violet," 4-merous. Calyx minute, campanulate-denticulate. Petals coherent halfway. Ovary glabrous, stipitate. Legumes in our specimens not matured, linear, curved, flat, glabrous, narrowed above into the acute style-base; about 3 in. long, ⅓–½ in. broad. The valves are thin, smooth, and already showing indication of transverse rupture. Seeds rather distant, 6–10.

Mozamb. Distr. Zambesi, Senna and Tette, *Dr. Peters! Dr. Kirk!*

M. pudica, L., the sensitive plant of Tropical America, with digitate pinnæ and tetrandrous flowers, occurs in Afzelius' herbarium from Sierra Leone.

12. SCHRANKIA, Willd.; Benth. et Hook. f. Gen. Plant. i. 593.

Flowers small, capitate, 5–4-merous, perfect or polygamous. Calyx minute. Petals united more or less. Stamens as many or twice as many as petals, free, exserted; anthers small, eglandular; "pollen-grains indefinite." Ovary subsessile, multiovulate; style filiform, stigma terminal, obtuse. Legume linear straight, aculeate throughout with spreading prickles, valves narrow, continuous, separating from the comparatively broad sutural replum. Seeds longitudinal, sub-rhomboidal, embryo between lateral layers of albumen.—Herbs or undershrubs, armed with short recurved prickles. Leaves bipinnate, often sensitive, rachis eglandular; leaflets small. Stipules setaceous. Peduncles short, solitary, or fascicled in the axils. Flowers rose or purple.

A small genus confined to the New World, with the following exception, which is common to Tropical Africa and America.

1. **S. leptocarpa,** *DC. Prod.* ii. 443. Branches often from a shrubby base, elongate, slender, scandent or scrambling (glabrous or) thinly pubescent, shortly aculeate and with prominent longitudinal lines or ridges from the leaf-bases. Pinnæ 2–3-jugate, subdistant, rachis usually sparingly aculeate; leaflets linear-oblong, broadly pointed or subapiculate, base obliquely truncate, glabrous, in 10–20 pairs; ¼–⅓ in. long. Peduncle ½ in. or less. Legume 3–4 in. long terminating in a long slender beak, longitudinally ridged, ridges bearing numerous patent straight prickles.

Upper Guinea. Cape Coast, *T. Vogel!* Accra, *Don.*

Vogel's specimen is not in fruit, but wholly agrees with the Tropical American specimens so far as it goes.

13. **LEUCÆNA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 594.

Flowers sessile, capitate, 5-merous. Calyx tubular-funnel-shaped, toothed. Petals narrow, free, valvate. Stamens 10, free, exserted; anthers elliptical or oblong, unappendaged, thinly pilose; "pollen-grains indefinite." Ovary shortly stipitate, multiovulate; style slender; stigma terminal, small, truncate. Legume broadly linear, flat, thinly coriaceous, 2-valved; valves continuous. Seeds flat, ovate, transverse; albumen thin.—Unarmed trees or shrubs. Leaves bipinnate, rachis with or without glands. Stipules minute. Flower-heads white pedunculate 1–3 from the upper axils or racemose at the extremities.

A small genus, almost wholly of America, where the following species is probably only truly indigenous.

1.* **L. glauca,** *Benth. in Hook. Journ. Bot.* iv. 1842, 416. A small unarmed tree, extremities young leaves and inflorescence puberulous. Pinnæ 3–6-jugate, occasionally a sessile gland between the lowest pair; leaflets linear, often subfalcate, acute, $\frac{1}{3}$–$\frac{1}{2}$ in. long. Heads globose, white, $\frac{3}{4}$ in. diameter, on peduncles of $\frac{3}{4}$–$1\frac{1}{2}$ in. from the upper axils. Legume flat, straight, 4–6 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. broad, narrowed at base into the stipes of $\frac{1}{3}$–$\frac{3}{4}$ in. (For synonymy see Mr. Bentham's paper, l.c.)

I have not seen any specimens alleged to be wild from Tropical Africa. It is cultivated here and there through the Tropics, and is frequently sent home by collectors. Kotschy distributed it from Kordofan, and T. Vogel collected it (in a garden) in Fernando Po.

14. **ACACIA,** Willd.; Benth. et Hook. f. Gen. Plant. i. 594.

Flowers capitate or spicate, sessile or very shortly pedicellate, usually 5–4-merous. Calyx campanulate or funnel-shaped, toothed or lobed. Petals free or united more or less, valvate. Stamens indefinite, exserted, free or consolidated at base with the disk; anthers minute; "pollen usually cohering in 2–4 masses in each cell." Ovary sessile or stipitate; ovules few or many; style slender with a small terminal stigma. Legume usually linear or oblong, flat, convex or terete, straight falcate or twisted, membranous coriaceous or woody, 2-valved or indehiscent, continuous or septate within; very rarely separating into articles. Seeds compressed.—Trees or shrubs, in African species usually spinose. Leaves bipinnate. Stipules spinescent, inconspicuous or submembranous. Bracts usually cohering in an involucel towards the middle, or at one extremity of the peduncle.

A very large genus, of which a great proportion is peculiar to Australia, the rest scattered through tropical and subtropical regions of both hemispheres. No subgenus or section is peculiar to Africa, although many of the species appear to be so. It is probable that on a general revision of the genus *Acacia* the forms grouped under and around *A. Catechu* amongst the spicate flowered, and *A. pennata* amongst the capitate-flowered species, may be differently distributed. I can only regard their treatment here as provisional. Too much reliance must not be placed on the alternatives of the following Clavis.

A. Flowers spicate.
Stipules spinose.
Pinnæ 4–6 (2–8) pairs, with gland between each pair . . 1. *A. albida.*
Pinnæ 7–13 pairs, 1 gland near base of rachis . . . . 2. *A. Lahai.*
Stipules not spinose ; spines infra-stipular, scattered or 0.
Leaflets 1-jugate.
Flowers shortly pedicellate. Pinnæ 2-jugate . . . . 3. *A. mellifera.*
Flowers sessile. Pinnæ 3-jugate . . . . . 4. *A. nigrescens.*
Leaflets 2–10-jugate.
Pinnæ 2–3-jugate. Leaflets 3–5-jugate, oblanceolate-oblong . . . . . 5. *A læta.*
Pinnæ 3–5-jugate. Leaflets 5–10-jugate, oblanceolate-oblong . . . . . 6. *A. venosa.*
Pinnæ 3–4-jugate. Leaflets 4–6-jugate, elliptical . . 7. *A. Welwitschii.*
Leaflets 10–50-jugate.
Leaflets usually 10–20-jugate.
Petals free nearly or quite from the base.
Spikes exceeding the leaves. Legume $\frac{3}{4}$–1 in. broad.
Pinnæ 3–5-jugate . . . . . 8. *A. Verek.*
Spikes usually shorter than leaves. Legume $\frac{1}{2}$–$\frac{2}{3}$ in. broad. Pinnæ 3–6-jugate. Flowers glabrate . 9. *A. glaucophylla.*
Pinnæ 8-jugate. Flowers purple. Calyx pubescent 10. *A. purpurea.*
Petals united $\frac{2}{3}$ their length. Flowers closely pubescent . . . . . 11. *A. erubescens.*
Leaflets usually 20–50-jugate.
Glands of leaf-rachis raised or stipitate (Prickles short, scattered) . . . . . 12. *A. ataxacantha.*
Glands sessile or 0.
Petals 3–5 times longer than calyx . . . . . 13. *A. macrostachya.*
Petals scarcely more than twice as long as calyx, or but slightly exceeding it.
Pinnæ 10–40-jugate, leaflets $\frac{1}{25}$–$\frac{1}{50}$ in. broad. Petals twice as long as calyx. Legume $\frac{1}{2}$–$\frac{3}{4}$ in. broad . . . . . 14. *A. Catechu.*
Leaflets about 1 line broad. Petals slightly exceeding calyx. Legume 1 in. broad, obtuse, irregularly, not transversely, reticulate . . . 15. *A. hecataphylla.*
Pinnæ 6–14-jugate, leaflets $\frac{1}{25}$ in. broad. Petals slightly exceeding calyx. Legume $\frac{1}{3}$–$\frac{2}{3}$ in. broad, obscurely transversely reticulate . . . 16. *A. Caffra.*
B. Flowers capitate.
Stipules scarcely or not at all spinescent.
Peduncles naked . . . . . 17. *A. pennata.*
Peduncles involucellate near the middle . . . . . 18. *A. amythethophylla*
Stipules spinescent.
Involucel obsolete. (Hoary-tomentose ; petals silky) . . 19. *A. lasiopetala.*
Involucel at apex of peduncle.
Pinnæ 4–8 jugate. (Legume turgid or cylindrical ; seeds crowded) . . . . . 20.**A. Farnesiana.*
Pinnæ 10–30-jugate . . . . . 21. *A. Sieberiana.*
Involucel usually at base of peduncle. (Compare *A. tristis*, p. 349.)
Pinnæ 6–30-jugate ; leaflets 20–40-jugate. Legume thinly coriaceous . . . . . 22. *A. abyssinica.*
Pinnæ 3–4-jugate ; leaflets 8–12-jugate. Legume thinly coriaceous . . . . . 23. *A. reficiens.*
Pinnæ 2–7-jugate ; leaflets 8-15-jugate. Legume thick, woody . . . . . 24. *A. hebeclada.*

Involucel between the extremities of peduncle.
  Legume straight or nearly so. (Compare *A. Adansonii*, p. 353, and *A. verugera*, p. 354.)
  Legume continuous (margins parallel).
    Pinnæ 2–12 pairs. Legume 1–3 in. long.
      Leaflets 6–15-jugate, 2–3 lines long; legume margin subalate, puberulous, grey . . . . . 25. *A. nubica.*
      Leaflets 6–15-jugate, 3–4 lines long; legume margin not alate . . . . . 26. *A. robusta.*
      Leaflets 14–30-jugate, 1–1½ lines long; legume glabrous, broad . . . . . 27. *A. etbaica.*
    Pinnæ 10–30 pairs. Legume 5–6 in. long . . . 21. *A. Sieberiana.*
    Pinnæ 6–11 pairs. Legume 4–6 in. long, pubescent 28. *A. tristis.*
  Legume constricted between the seeds.
    Valves not tubercled . . . . . 29. *A. arabica.*
    Valves tubercled . . . . . 30. *A. Kirkii.*
Legume falcate, not twisted, not exceeding ⅓ in. broad.
  Pinnæ in 3–10 pairs.
    Legume broadly constricted, ⅙–¼ in. broad . . . 31. *A. Seyal.*
    Legume scarcely or not constricted, ⅙ in. broad . 32. *A. stenocarpa.*
  Pinnæ in 1–2 pairs. Legume broadly constricted . 33. *A. Ehrenbergiana.*
Legume spirally twisted.
  Legume puberulous or pubescent . . . . . 34. *A. spirocarpa.*
  Legume glabrous . . . . . 35. *A. tortilis.*

1. **A. albida,** *Delile, Fl. Ægypt.* 142, t. 52, 3. A large tree, much divaricately branched, with whitish or pale grey bark; extremities wholly glabrous or puberulous. Stipular spines straight, spreading, rather stout at base, usually not exceeding ½–¾ in., frequently much shorter or rudimentary. Leaves glabrous or puberulous; rachis usually from ½–3 in. in length with a sessile gland between each of 4–6 (2–8) pairs of pinnæ; leaflets oblong, mucronulate, the midrib very oblique, in 7–17 pairs, 1½–3 (4) lines long. Spikes axillary, solitary or geminate, with peduncle 2½–5 (7) in. long. Flowers sessile, "white," glabrous (or pubescent in *A. saccharata*). Calyx short, cupuliform, broadly toothed, glabrous or puberulous. Petals free nearly from the base, 4 times longer than calyx. Legume flat, oblong, arcuate, often sinuous on the outer suture, valves coriaceous, often transversely nerved and reticulate or at length smooth, 2–4 or 5 in. long, ½–1 (1¼) in. broad, on a very short stipes.—*A. saccharata*, Benth. in Lond. Journ. Bot. 1842, 505; *A. gyrocarpa*, Hochst. in Schimp. Pl. Abyss.

Upper Guinea. Senegambia, *Robert! Lelieur!* A pubescent unarmed form (*A. saccharata*, Bth.), *Heudelot!*

Nile Land. Abyssinia, *Schimper! Capt. Pullen!* Nubia, *Petherick!* and others. Upper Nile, *Speke and Grant! Schweinfurth.*

Lower Guinea. Mossamedes, *Dr. Welwitsch!* A noble form, pubescent both extremities and leaves, the racemes with peduncle 6–7 in. long, and the straight or arcuate flat legumes rather over 1 in. broad.

Mozamb. Distr. Zambesi, *Dr. Kirk!*

To this species I would also refer with doubt, *A. mossambicensis*, Bolle in Peters' Mossamb. Bot. i. 5. I do not observe any character in the published description by which it differs, excepting in the absence of spines. This, however, occurs occasionally in *A. albida.*

Guillemin and Perrottet (Fl. Seneg. 245) would refer *A. Senegal*, Willd., DC. Prod. ii. 459, to this species. Mr. Bentham leaves the identification of this plant and of *A. Asak*, Willd. doubtful (Hook. Journ. Bot. 1842, 509), but notes that they "are evidently near *A. hamulosa*, Bth. (an Arabian species) and *A. Verek*, G. and P., and perhaps identical with the one or the other."

2. **A. Lahai,** *Steud. et Hochst.; Benth. in Lond. Journ. Bot.* 1842, 506. A small or medium-sized tree; extremities glabrous, with a brownish or ashen bark. Stipular spines occasionally very short, usually prominent, patent, straight, $\frac{1}{2}$–2 in. long, flattened below on the upper face. Leaves puberulous or glabrescent; rachis $1\frac{1}{2}$–4 in., with a small gland near the base; pinnæ in 7–13 pairs; leaflets linear-oblanceolate or linear, rather obtuse, in 12–26 pairs, $1\frac{1}{2}$–2 lines long. Spikes axillary solitary or 2–3 together, 2–4 in. long. Flowers sessile. Petals free at the apex, about 4 times as long as the short deltoid-toothed calyx. Legume broadly oblong, obtuse, minutely apiculate, abruptly narrowed at base into a stipes of $\frac{1}{4}$–$\frac{1}{2}$ in., flat, valves coriaceous, brown, shining, much reticulate, 2–$2\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{1}{6}$ in. broad.—A. Rich. Fl. Abyss. i. 240; Schweinf. Acacien-arten d. Nilgebiets, 359.

Nile Land. Abyssinia, *Dillon and Petit! Schimper! Capt. Pullen!*

3. **A. mellifera,** *Benth. in Hook. Lond. Journ. Bot.* 1842, 507. Shrub or small tree, wholly glabrous, with brownish or sometimes pale and glaucous extremities, unarmed excepting a pair of short recurved infra-stipular prickles, usually below each node. Leaves as broad as long, not exceeding 1–2 in., glaucous at least beneath; pinnæ in 2 pairs; leaflets unijugate, obliquely obovate-oblong or obovate-rotundate, obtuse entire or retuse, the larger leaflets $\frac{1}{3}$–$\frac{1}{2}$ in. long. Spikes axillary, fascicled, equalling or exceeding the leaves. Pedicels about equalling the short truncate calyx. Petals 3–5 times longer than the calyx, apparently united to the middle. Legume flat, few-seeded, oblong, continuous or sinuous, apiculate, narrowed at base, valves thinly coriaceous, transversely venose, pale and glabrous, $1\frac{1}{2}$–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad.—*Mimosa mellifera*, Vahl, Symb. ii. 103, and *Inga mellifera*, Willd. Sp. Pl. iv. 1006 (fide Benth. l.c.)

Upper Guinea. Niger, *Barter!* ("Yields a gum like gum-arabic.")
Nile Land. Abyssinia, *Schimper!* Nubia, *Dr. Schweinfurth!* Sennaar, *Kotschy!* Kordofan and Upper White Nile, *Dr. Schweinfurth!*
Also on the Arabian side of the Red Sea.

4. **A. nigrescens,** *Oliv.* Arborescent, wholly glabrous; young shoots, peduncles, and leaves more or less glaucous. Infra-stipular spines geminate, very acute, short or sharply recurved, brownish-black. Leaves $1\frac{1}{2}$–$2\frac{1}{2}$ in. long; rachis slender, with 1 (or 2) slightly elevated gland; pinnæ 3-jugate; leaflets 1-jugate, broadly and very obliquely obovate-rotundate, entire or retuse, reticulate, drying blackish paler beneath, $\frac{1}{3}$–$\frac{1}{2}$ in. long, 3–5 lines broad. Spikes axillary, solitary in our specimen, a little exceeding the leaves; flowers rather lax at least below, sessile or subsessile. Calyx deeply rather acutely toothed. Petals

free, twice as long as the calyx. Ovary glabrous, on a stipes of its own length. Legume not seen.

Mozamb. Distr. Near Mitonda, Shire river, *Dr. Kirk!*

5. **A. læta,** *R. Br.; Benth. in Hook. Journ. Bot.* 1842, 508. A small or moderate-sized tree, wholly glabrous. Extremities brown, smooth, with short black and shining hooked infra-stipular prickles, or wholly unarmed. Leaves glaucous, scarcely exceeding 2–3 in. in length; pinnæ lax in 2–3 pairs; leaflets oblanceolate- or obovate-oblong oblique, obtuse, often mucronulate, subsessile, in 3–5 pairs; $\frac{1}{4}$–$\frac{1}{3}$ in. long, $1\frac{1}{2}$–2 lines broad above. Spikes axillary, solitary or fascicled, equalling or exceeding the leaves. Flowers subsessile. Calyx broadly and shortly toothed. Petals at least at first united about $\frac{2}{3}$ their length. Ovary glabrous, shortly stipitate. Legume flat, oblong, often once or twice constricted owing to abortion of seeds, obtuse or pointed; valves thinly coriaceous, transversely reticulate, glabrous, shortly stipitate, 2–3 in. long, $\frac{3}{4}$–1 in. broad.—Schweinf. Acacien-arten d. Nilgebiets, 367, t. 19, 20, 21; Reliq. Kotschyanæ, t. 1, 2.

Nile Land. Abyssinia, *Salt; Schimper!* Nubia, *Dr. Schweinfurth!*

6. **A. venosa,** *Hochst.; Benth. in Lond. Journ. Bot.* 1846, v. 98. Shrub or small tree, branches pale, wholly glabrous, or young shoots at first and peduncles puberulous. Infra-stipular spines very short, hooked, often wanting. Leaf-rachis 2–3 in., slender, with or without a small sessile gland near the base; pinnæ in 3–5 (–7) subdistant pairs; leaflets rather distant, 5–8-(–10) jugate, broadly oblanceolate obovate-oblong or oblong-obtuse, paler or glaucous beneath, minutely petiolulate, 3–5 lines long. Spikes in axillary fascicles of 2–5, developed before or with the young leaves, 1–$1\frac{1}{2}$ in. long. Flowers (rose-coloured) rather lax, sessile, glabrous, excepting the short obtuse calyx-lobes. Petals united to the middle, more than twice as long as the calyx. Legume linear-oblong, flat, straight, 4–6 in. long, $\frac{3}{4}$–1 in. broad, valves continuous or slightly sinuous, thinly coriaceous, transversely reticulate, glabrous, 5–7-seeded.—*A. sanguinea,* Hochst.; A. Rich. Fl. Abyss. i. 245; Schweinf. Acacien-arten d. Nilgebiets, 364.

Nile Land. Abyssinia, *Schimper! Capt. Pullen!*

7. **A. Welwitschii,** *Oliv.* A tree of moderate size; extremities wholly glabrous, dark-coloured, sometimes glaucous. Infra-stipular prickles, short, black, polished, hooked. Leaves about 3–5 in. long, glabrous; rachis slender, with a sessile gland below the lowest pinnæ; pinnæ 4–3–2-jugate; leaflets elliptical or varying from ovate to obovate, obtuse, obscurely apiculate or mucronulate, smooth or shining above, $\frac{1}{4}$–$\frac{2}{3}$ in. long, 2–5 lines broad, in 3–6 pairs, minutely petiolulate. Spikes slender in bud, rather lax, 2 or 3 from each axil, or on short axillary leafless shoots sometimes panicled at the extremities. Flowers subsessile. Calyx campanulate, 5-fid. Petals free near the base, scarcely more than twice as long as the calyx. Legume straight, flat,

linear-oblong, apiculate or pointed, margins continuous, 2-valved, 5–6-seeded, valves thin but firmly coriaceous, glabrous or pulverulent, obscurely reticulate, 3–5 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. broad.

Lower Guinea. On the Zenza, B do Bengo, Loanda and Ambriz, Angola, *Dr. Welwitsch!*

Mozamb. Distr. Zambesi, below Tette, *Dr. Kirk!*

8. **A. Verek,** *Guill. et Perr. Fl. Seneg.* i. 245, t. 56. Branches pale, glabrous or glabrescent. Infra-stipular prickles geminate or ternate, short, polished, recurved. Leaves in our specimens not exceeding 1–1½ in., rachis pubescent with a gland between the upper pinnæ and one near the base; pinnæ in 3–5 pairs, leaflets in 10–15 pairs, linear-oblong, scarcely acute, 2 lines long more or less. Spikes exceeding the leaves, shortly pedunculate, axillary, solitary, or 2 or 3 together, 2–3 in. long. Flowers sessile, glabrous or glabrate, rather lax. Calyx cupuliform, toothed to the middle. Petals free or irregularly cohering, rather longer than the calyx. Legume oblong, straight, flat, margin continuous or slightly sinuous, owing to occasional abortion of seeds, obtuse or mucronate, narrowed at base, 3–4 in. long, $\frac{3}{4}$–1 in. broad, valves thinly coriaceous, obsoletely puberulous, obscurely reticulate. "Seeds subrotundate, much compressed, as long as broad or sometimes broader than long." Schweinf. Acacien-arten d. Nilgebiets, 374, t. 22 a.; Reliq. Kotschyanæ, t. 3.

Upper Guinea. Senegambia, *Heudelot! Brunner! Bidjem!*

Nile Land. Southern Nubia, *Dr. Schweinfurth.* Kordofan, *Cienkowsky.*

Guillemin and Perrottet reduce here *Mimosa senegalensis*, Lam. This species affords, according to these botanists, an important part of the Gum Arabic of commerce, and according to Dr. Schweinfurth (*Reliq. Kotschyanæ*, 4), the best white gum of the Nile region. Upon the gums of Senegal, see a Memoir by Dr. Flückiger in Schweiz. Wochenschrift Pharm. 1869, with a figure of *A. Verek*.

Allied to *A. Verek* is a plant in flower only, with but a single developed leaf, in Dr. Welwitsch's herbarium from Mossamedes. The calyx and petals are externally minutely sericeous ("*lepidote-sericeus*," *Welw.*). The petals are free from the base, about twice as long as the calyx; the ovary glabrous on a stipes of its own length. Flowers precocious.

9. **A. glaucophylla,** *Steud.*; *A. Rich. Fl. Abyss.* i. 243. Tree or large shrub, wholly glabrous or extremities puberulous; branches brown or reddish-brown to grey. Infra-stipular prickles geminate or ternate, short, straight or slightly recurved, frequently wanting. Leaf-rachis from 1½–3½ in., minutely pubescent or glabrous, usually with a small gland near the base; pinnæ 3–6-jugate, leaflets in 12–20 pairs, oblong or oval-oblong, obtuse, 3–5 lines long. Inflorescence and flowers as in *A. Verek*, the spikes usually shorter than the leaves. Ovary glabrous. Legume linear, straight, flat, apiculate or acuminate, narrowed at base, 3–4½ in. long, ½–⅔ in. broad, valves thinly coriaceous, glabrous, finely transversely reticulate, slightly convex over each seed. "Seeds oval, longer than broad" (*Schweinfurth*).—*A. triacantha*, Hochst.; A. Rich. l.c. 244; Schweinf. Acacien-arten d. Nilgebiets, 372, t. 22 b.

Nile Land. Abyssinia, *Schimper!* Southern Nubia, *Schweinfurth.* Hor Tamanib, Red Sea, *J. K. Lord!*

Nearly allied to *A. Verek*, from which the different proportion in length of spike and leaf, and the narrower fruit distinguish it.

10. **A. purpurea,** *Bolle in Peters' Mossamb. Bot.* i. 6. A small tree with green-grey tomentose or thickly pubescent extremities. Leaf-rachis clothed with yellowish pubescence, bearing concave sessile glands between the pinnæ, which are in 8 pairs; leaflets 12-jugate, very shortly petiolulate, oblong, obtuse, thinly pilose, 3 lines long, 1½ lines broad. Spikes equalling the leaves, dense, pilose. Flowers purple. Calyx hairy with finely pointed teeth. Petals free nearly to the base. Legume not seen.

Mozamb. Distr. Zambesi, *Dr. Peters.*

I do not know this plant, nor have I identified it amongst Dr. Kirk's collections. Dr. Bolle puts it in Mr. Bentham's section *Vulgares—Diacanthæ.*

11. **A. erubescens,** *Welw. mss.* A small much-branched tree; extremities obsoletely pubescent, pale cinnamon-brown. Infra-stipular prickles short, sharply recurved. Leaf-rachis 1–1½ in., slender, thinly pubescent, with a sessile small gland below the lowest pinnæ; pinnæ in 4–5 pairs, leaflets 10–14-jugate, linear-oblong, obliquely broadly pointed, glabrous, drying pale green, 2–3 lines long. Spikes axillary on leafless branches, about 1½ in. long with the short peduncle, rather dense. Flowers rose-white (grey-yellow when dry), sessile. Calyx cupuliform, 5-fid, with ovate- or oblong-lanceolate teeth, clothed with short dense grey tomentum. Petals united two-thirds their length, rather longer than the calyx and similarly pubescent externally. Ovary very shortly stipitate. Legume not seen.

Lower Guinea. Bumbo, Angola, *Dr. Welwitsch!*

Affords abundantly the best gum collected in this region (Dr. W.).

12. **A. ataxacantha,** *DC.; Benth. in Hook. Journ. Bot.* 1842, 511. Shrub with long slender branches, puberulous or pubescent at first, at length often glabrate. Prickles scattered, short, decurved, sometimes wanting. Leaf-rachis 3–6 in. long, with a raised or substipitate gland near the base; pinnæ in 7–15 pairs, leaflets linear, subfalcate, pointed or obtuse, 2 lines long more or less, in 20–40 pairs; stipules membranous, ovate-lanceolate, ½-cordate at base, deciduous. Spikes axillary, solitary or geminate, 2–3 in. long; flowers rather dense, subsessile, white. Calyx shortly toothed. Petals united nearly throughout, twice as long as the calyx. "Legume 2-valved, broadly linear, flat, chartaceous, glabrous."—Guill. et Perr. Fl. Seneg. i. 244.

Upper Guinea. Senegambia, *Heudelot!* Quorra, *T. Vogel!* Confluence of Quorra and Tschada, *Barter!*

13. **A. macrostachya,** *Reichenb.; Benth. in Lond. Journ. Bot.* 1842, 511. Extremities rusty tomentose-pubescent, with scattered occasionally infra-stipular short recurved prickles. Leaf-rachis similarly pubescent with a conspicuous oblong sessile gland near the base,

4–9 in. long; pinnæ in 14–30 pairs; leaflets linear, subfalcate, acute, thinly silky-pubescent at least beneath, in 25–50 pairs, 2–2½ lines long. Stipules ovate or semi-cordate, deciduous. Spikes axillary, usually fascicled, 3–4 in. long, rather lax, sometimes racemose from the axils of reduced leaves towards the extremities. Flowers sessile. Calyx shortly toothed. Petals united nearly throughout, 3–5 times longer than the calyx. Ovary villous, stipitate.

Upper Guinea. Senegambia, *Sieber!* Sierra Leone, *Hutton!*
Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
None of the specimens are in fruit. The only noteworthy difference that I observe between Dr. Welwitsch's and the type specimen is in the more conspicuous subulate pilose bracteoles of the latter, which in very young spikes—long before expansion of the flowers—are rather conspicuously exserted. The stipes of the ovary also in the Angola plant may be rather longer, and the petals not united quite so far.

14. **A. Catechu,** *Willd.; Benth. in Lond. Journ. Bot.* 1842, 570. Tree of large or medium size; extremities at least at first pubescent tomentose or puberulous. Infra-stipular spines short, usually from a stout base, recurved, acute, occasionally wanting. Leaf-rachis 3–6 in. long, pubescent or glabrate, sometimes aculeolate, generally bearing several sessile glands between or near the pinnæ besides one towards the base; pinnæ in 10–30 (or 40) pairs or alternating; leaflets linear, more or less acute, 1–2½ lines long, $\frac{1}{25}$–$\frac{1}{50}$ in. broad, rather closely 30–50-jugate. Spikes axillary, solitary or fascicled, 2–5 in. long, pubescent or tomentose. Flowers subdense, sessile. Calyx campanulate, acutely toothed. Petals united ½–¾ their length, twice as long as the calyx or nearly so. Legume broadly linear, straight or nearly so, flat, apiculate, shortly stipitate, 3–5 in. long, ½–¾ in. broad, valves coriaceous, glabrous, shining, reticulate, 6–8-seeded.—*A. campylacantha*, Hochst. and *A. erythrantha*, Steud.; A. Rich. Fl. Abyss. i. 242–3. For additional synonymy see Mr. Bentham's memoir cited.

Nile Land. Abyssinia, *Petit! Schimper!* Gallabat, *Dr. Schweinfurth!* Madi (756.5 leaf only), and Noer Country (767.8), *Speke and Grant!* Sennaar, *Dr. Schweinfurth.*
Mozamb. Distr. Zambesi, between Tette and the Coast, *Dr. Kirk!*
A common Indian species.

15. **A. hecataphylla,** *Steud.; A. Rich. Fl. Abyss.* i. 242. Tree; branches finely hoary-tomentose. Infra-stipular prickles short, recurved, often wanting. Foliage and inflorescence as described of *A. Catechu*, excepting that the leaflets are larger, oblong, and obtuse, 2–3 lines in length, about 1 line broad, and the glands of the rachis fewer. Flowers sessile, pubescent; petals united near the middle, but slightly exceeding the calyx. Legume oblong, obtuse 4 (3–7) in. long, 1 in. broad, valves firmly coriaceous, irregularly and rather obscurely reticulate when ripe, the obscurely raised branching nervures ramifying irregularly, not generally transversely. Seeds about 5 (3–7).

Nile Land. Abyssinia, *Schimper!* Madi (755 and No. 9 App. Travels), *Speke and Grant!*
Differs from *A. Catechu* in the larger obtuse leaflets and thicker legume.

16. **A. Caffra,** *Willd.*; *Benth. in Hook. Journ. Bot.* 1842, 509. Attaining about 20 ft.; extremities pubescent or glabrous. Infra-stipular spines short, dilated at the base, usually slightly recurved at the apex, frequently wanting; occasionally similar thinly scattered spines occur on the internodes. Leaf-rachis usually puberulous, sometimes aculeolate bearing a sessile gland near the base, 2–4 in. long; pinnæ in 6–14 pairs; leaflets linear-oblong, broadly pointed or obtuse, 2 lines long, and $\frac{1}{2}$ line broad more or less, in 20–40 pairs. Spikes dense, shortly pedunculate, solitary or in fascicles of 2 or 3, shorter than or occasionally exceeding the leaves. Flowers sessile. Calyx cupuliform, teeth $\frac{1}{3}$–$\frac{1}{2}$ its depth. Petals narrowed and free at the base, united at the middle; but slightly exceeding the calyx. Legume linear, straight, flat, acuminate or apiculate, stipitate, valves coriaceous, glabrous, obscurely transversely veined, 5–8-seeded, $2\frac{1}{2}$–4 in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. broad.

Lower Guinea. Bumbo (flower) and Mossamedes (fruit), Angola, *Dr. Welwitsch!*
South Central. Lake Ngami, *Maccabe!*
Common in some parts of South extra-tropical Africa.

The legumes of Dr. Welwitsch's specimens are from $3\frac{1}{2}$–$4\frac{1}{2}$ in. long, and nearly $\frac{3}{4}$ in. broad, broader and more coriaceous than any specimens which I have seen from the Cape, but they are the only quite mature fruits I have had access to. They are indeed almost the counterpart of the legumes of the Abyssinian forms referred to *A. Catechu* (*A. campylacantha*, Hochst.), in which, however, the pinnæ and smaller leaflets are more numerous.

17. **A. pennata,** *Willd.*; *Benth. in Hook. Journ. Bot.* 1842, 516. Shrub usually scandent more or less, occasionally erect, aculeate; extremities pubescent or glabrous, the epiderm often early fissuring longitudinally; prickles numerous or sparse, scattered between the nodes and frequently upon the leaf-rachis, short, compressed, conical, decurved. Stipules linear or oblong, striate, not spinescent, early deciduous. Pinnæ in 8–20 pairs, usually 10–15, or alternating more or less; rachis usually with a conspicuous gland near the base; leaflets linear, somewhat pointed, base oblique, in 30–60 or -70 pairs, 1–3 lines long. Flowers capitate, peduncles slender, $\frac{1}{3}$–1 in. long, ebracteate, fascicled at the nodes of leafless racemes, either axillary or collected in lax terminal panicles. Calyx rather acutely toothed. Petals connate $\frac{1}{2}$ or $\frac{2}{3}$ their length, but slightly exceeding the calyx. Ovary usually pubescent on a distinct stipes. Legume flat, linear-oblong, frequently faintly constricted between the seeds or undulate, 2-valved, valves thinly coriaceous, glabrous or glabrate, usually with more or less distinct transverse reticulation, $2\frac{1}{2}$–7 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ broad. Seeds 3–9, compressed, roundish or elliptical, usually subdistant (var. *dolichosperma*). For synonymy see Mr. Bentham's memoir cited above.

Upper Guinea. Sierra Leone, *Afzelius!* Kongui and Bagroo rivers, *Mann!* Princes Island, *Mann!*
Nile Land. Abyssinia, *Dr. Roth!*
Lower Guinea. Huilla, Angola, *Dr. Welwitsch!* (an erect shrub of 5–7 ft.)
Mozamb. Distr. Shire Valley and on the Zambesi, *Dr. Kirk!* Ugogo, Marenga Mkhali, *Speke and Grant!*

Var. *dolichosperma*. Valves and legume more coriaceous, nervation very obscure.

Seeds rather closely packed, transverse, oblong, but slightly compressed, dark reddish-brown, shining. Not improbably a distinct species. Pungo Andongo and Golungo Alto, Angola, *Dr. Welwitsch!* This I take to be *Acacia pentaptera* of Dr. Welwitsch in Apont. Phyto-geogr. 584.

Widely spread in Tropical Asia; occurring also at Natal.

Acacia pentagona, Hook. f. Fl. Nigrit. 331, is nearly allied to the above if not a mere form. The only specimen in the Kew Herbarium is very imperfect. It exhibits linear, longitudinally striate stipules, 2–3 lines in length, which, however, I have noticed in *A. pennata*. How far it may be correctly identified with *Mimosa pentagona*, S. and T. Pl. Guin. 324, I cannot say. The latter is described as a glabrous shrub, with scattered recurved prickles.

18. **A. amythethophylla,** *Steud.; A. Rich. Fl. Abyss.* i. 245. Tree of medium size; extremities puberulous. Stipular spines minute or stipules near the base of the shoots scarcely spinescent. Leaves $\frac{1}{2}$–1 ft. long, rachis puberulous or glabrate "with a gland near the base"; pinnæ in 12–30 pairs; leaflets 30–50-jugate, linear-oblong, obliquely pointed, glabrous, 2–$2\frac{1}{2}$ lines long. Peduncles $\frac{1}{2}$–1 in. long, involucellate near the middle, fascicled 3–5 in each node along a leafless terminal raceme $\frac{1}{2}$–$\frac{3}{4}$ ft. in length. Flowers capitate. Calyx minute, denticulate. Petals connate, 3–4 times exceeding the calyx. Legume (according to Dr. Schweinfurth) linear-oblong, flat, 4–6 in. long, 7–8 lines broad, valves coriaceous, shining, obsoletely veined. Seeds 8–12. —Schweinf. Acacien-arten d. Nilgebiets, 360.

Nile Land. Abyssinia, *Schimper!*

I have only seen flowering specimens. Mr. Bentham reduces this plant to *A. xiphocarpa*, Hochst. (Lond. Journ. Bot. 1846, 96), but Dr. Schweinfurth, who describes the fruit, keeps it apart. I should probably have followed Mr. Bentham were it not on account of the racemose leafless inflorescence of *A. amythethophylla*.

19. **A. lasiopetala,** *Oliv.* Extremities uniformly softly hoary-tomentose. Stipular spines straight or subrecurved, pubescent nearly to the apex. Young leaves, especially on the rachis, silky tomentose; pinnæ in 14–22 pairs; leaflets 20–30 pairs, probably often more numerous, not wholly developed in our specimens; gland sessile near the base of the rachis. Peduncles in pairs or solitary from the lower axils, pubescent, 1–2 in. long. Bracts obsolete. Flowers capitate. Calyx pilose-pubescent, lobes ovate obtuse. Petals externally silky, cohering $\frac{1}{2}$ or $\frac{2}{3}$ their length, about half as long again as the calyx. Ovary subsessile, glabrous, subtruncate above, with an obliquely inserted filiform style. Fruit unknown.

Mozamb. Distr. Foot of Impemba Peak, Shire river, *Dr. Kirk!*

20.* **A. Farnesiana,** *Willd.; Benth. in Hook. Journ. Bot.* 1842, 494. Small tree or shrub; extremities glabrous or obsoletely pubescent, slightly zigzag from node to node. Stipular spines slender, straight. Pinnæ in about 6 (4–8) pairs; rachis pubescent or glabrate, usually with a minute, sessile gland near the base; leaflets in 12–20 pairs, linear-oblong, obtuse or broadly acute, glabrous or glabrate, 2–3 lines long. Peduncles 1–3 from each axil, $\frac{1}{2}$–$1\frac{1}{2}$ in. long, slender, pubescent or glabrate; bracts immediately under the globose head. Calyx

denticulate, glabrous. Petals united nearly throughout, twice as long as calyx. Legume turgid, cylindrical, or subfusiform, straight or curved, finely obliquely striate, glabrous, indehiscent or tardily opening, 2–3 in. long. Seeds crowded, irregularly biseriate.

Probably of American origin, and frequently cultivated throughout the Tropics for the sake of the perfume afforded by its flowers, but not indigenous in Tropical Africa unless in Angola (Loanda and Golungo Alto), where Dr. Welwitsch describes it as at least subspontaneous.

21. **A. Sieberiana,** *DC. Prod.* ii. 463. A tree varying from 20–30 ft. to more than twice the height; extremities at first villous-pubescent or pubescent, often early glabrate or obsoletely puberulous. Stipular spines straight, usually short on flowering shoots. Pinnæ in 10–30 pairs; rachis pubescent or glabrate with a sessile, rather large, disciform gland near the base, and additional glands between the upper pinnæ; leaflets linear-oblong, usually obtuse, in 20–40 pairs, glabrous, or more or less pilose; 1–2 lines long. Peduncles slender, thinly pubescent or pilose, 1–2 in. long, solitary from the lower axils or fascicled above; involucel at the apex or varying to nearly the middle of the peduncle. Flowers capitate; calyx shortly toothed, pubescent above. Legume 2-valved, straight or slightly curved, compressed, acuminate, much narrowed at the base, margins parallel, 6–7 in. long, $\frac{3}{4}$ in. more or less broad, seeds 13–15, uniseriate, embedded in pulp; valves coriaceous, dark-brown, smooth, glabrous, at length when mature fissuring transversely (fruit described from Dr. Welwitsch's specimens).—Benth. in Hook. Journ. Bot. 1842, 498; *A. Sing*, Guill. et Perr. Fl. Seneg. i. 251.

Upper Guinea. Senegambia, *Sieber! Döllinger!*

North Central. Common 60 miles South of Kouka, *E. Vogel!* (A tree attaining 80 ft., nearly wholly glabrous, rigid with fewer pinnæ and longer spines than in the ordinary state. Calyx glabrous or nearly so. This plant may prove distinct when fruit is found).

Nile Land. Madi (680.5), *Speke and Grant!* (leafy specimen only).

Upper Guinea. Ambriz, Pungo Andongo and Cazengo, Angola, *Dr. Welwitsch!*

22. **A. abyssinica,** *Hochst.; Benth. in Hook. Journ. Bot.* 1846, 97. Tree; extremities softly pubescent or at length nearly glabrous. Stipular spines very short; occasionally stipules scarcely spinose. Pinnæ in 6–30 pairs from a pubescent or glabrous rachis with or without a gland near the base and one or two between the upper pinnæ; leaflets in 20–40 pairs, linear, obtuse or subacute, $1\frac{1}{2}$ lines long. Peduncles 3–5 from each axil, $\frac{1}{2}$ in. long more or less, pubescent, involucellate near the base. Flowers capitate. Calyx-teeth pilose. Petals united nearly throughout, 2–3 times longer than the calyx. Legume compressed, linear-oblong, straight or subfalcate, shortly and broadly pointed or obtuse, at length 2-valved, valves continuous, slightly convex when mature, coriaceous, longitudinally often obsoletely areolate-venose; 3–5 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. broad.—*A. xiphocarpa*, Hochst. in Hb. Schimp. Abyss. No. 522; Benth. l.c. 96. *Inga Nafasia*, Hochst. in Hb. Schimp. Abyss. No. 940.

Nile Land. Abyssinia, *Schimper!*

I do not feel much confidence in referring the plants cited to one species. The leaves, spines, and position of the involucel agree fairly well.

23. **A. reficiens,** *Wawra et Peyr., Sert. Beng.* 15. A low much-branched shrub of 3–6 ft. with white bark; extremities at length glabrous, grey. Stipular spines short, sharply recurved. Leaf-rachis $\frac{1}{2}$–1 in. long with a sessile gland near the base, and occasionally a minute one between the upper pinnæ; pinnæ in 3–4 pairs; leaflets in 8–12 pairs, oblong, obtuse, glabrate, glaucous-green, coriaceous, $2\frac{1}{2}$–3 lines long, nearly 1 line broad. Peduncles axillary, $\frac{1}{2}$–1 in., the involucel near the base. Legume 2-valved, straight or slightly curved, linear, margins parallel, compressed, obtuse or obtusely pointed, 3–$3\frac{1}{2}$ in. long $\frac{1}{2}$–$\frac{2}{3}$ in. broad; valves rather thinly coriaceous, nearly smooth or very obscurely longitudinally nervose, dark brown, obsoletely puberulous; 5–8-seeded.

Lower Guinea. Mossamedes, *Dr. Welwitsch!* Between Benguella and Katombela, *Dr. Wawra.*

Described from Dr. Welwitsch's specimens, and identified by above-cited description only. Dr. Wawra's plant is described as a shrub of 8–12 ft.; pinnæ 2–3-jugate, leaflets 7–15-jugate.

24. **A. hebeclada,** *DC.; Benth. in Hook. Journ. Bot.* 1842, 499. Branches pubescent. Spines scarcely exceeding $\frac{1}{2}$ in. in our specimens, the lowest of each shoot short, slightly curved, the upper straight. Pinnæ in 2–7 pairs; rachis pilose-pubescent, interpinnal glands very minute; leaflets linear-oblong, broadly acute or obtuse, thinly ciliolate or glabrous, in 8–15 pairs. Peduncles solitary or 2 or 3 from each axil, $\frac{1}{2}$–$1\frac{1}{4}$ in. long; bracts minute at the base (or occasionally near the middle?) of the peduncle. Flowers capitate. (Calyx denticulate, pilose-margined, half as long as petals in the Cape form.) Legume straight, thick, 2-valved, with a continuous cavity, oblong or linear-oblong, obtuse or apiculate, compressed, valves continuous, woody, longitudinally faintly ridged, 3–6 in. long, $\frac{3}{4}$–1 in. broad, nearly $\frac{1}{2}$ in. in thickness. Seeds compressed, with a long funicle, broadly elliptical or roundish, $\frac{1}{3}$–$\frac{1}{2}$ in. long.

South Central? *Baines!* Without precise locality.

Also south of the Tropic. Baines' plant is in fruit only.

25. **A. nubica,** *Benth. in Lond. Journ. Bot.* 1842, 498. Shrub; branches glabrescent, young shoots at first pubescent. Stipular spines straight or very slightly curved. Pinnæ in 3–12 pairs; rachis thinly pubescent or glabrate with 2 or 3 minute sessile glands or eglandular; leaflets in 6–15 pairs, oblong obtuse or broadly pointed, glaucous, 2–3 lines long. Peduncles 1–3 from each axil, pubescent or puberulous, about $\frac{1}{2}$ in. long, bearing the involucel usually below the middle. Calyx-teeth short, rounded. Petals connate nearly throughout, scarcely twice as long as the calyx. Legume linear-oblong, straight or nearly so, compressed, narrowed at each end, margins narrowly compressed or subalate, valves continuous, slightly convex, firmly coriaceous,

faintly longitudinally striate, pale yellowish grey, puberulous, narrowly subalate, few (5–10)-seeded, 2–3 in. long, about ½ in. broad.—*A. Aucheri*, Benth. l.c. 499; *A. pterygocarpa*, Hochst., Benth. in Journ. Bot. 1846, 96.

Nile Land. Abyssinia, *Schimper!* Nubia, *Kotschy! Schweinfurth!*

The same plant occurs in Aucher-Eloy's Oriental Herbarium (No. 4372); identified by Mr. Bentham with *A. pterygocarpa.* Dr. Schweinfurth distinguishes two varieties: *α. erythræa* (=*A. pterygocarpa*) with fewer and laxer pinnæ and leaflets, sometimes curved spines and precocious flowers; and *β. æthiopica* (=*A. nubica*) with more numerous and denser pinnæ and leaflets, and always straight spines.

26. **A. robusta,** *Burch.; Benth. in Hook. Journ. Bot.* 1842, 501. A small much-branched tree; branches stout, terete, puberulous or glabrous. Stipular spines straight, spreading, at length ivory-white, occasionally very short or obsolete. Leaf-rachis 1–2½ in. long, glabrous or obsoletely puberulous, eglandular excepting frequently between the pinnæ occurs a small gland depressed in the centre; pinnæ in 2–3 (1–5) pairs, leaflets 7–15-jugate, oblong or oval-oblong, more or less obtuse, coriaceous, ¼–⅓ in. long, 1–1½ lines broad. Flowers yellow, capitate, on straight fascicled axillary peduncles, ½–1 in. long, bearing the involucel below the middle. Calyx shortly and obtusely toothed. Petals united ⅔–¾ their length, twice as long as the calyx. Legume (in Cape specimens) straight, linear-oblong, pointed, much narrowed below, flat, margins continuous; valves (immature) obscurely longitudinally furrowed, rugulose, glabrous, 1½–2 in. long, ½–⅔ in. broad.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

27. **A. etbaica,** *Schweinf. Acacien-arten d. Nilgebiets*, 330, t. 7, 8. Slender tree attaining 20–30 ft., extremities reddish-brown, early glabrous. Stipular spines rather short, ascending, occasionally obsolete. Leaves glabrous, rigid; pinnæ in 3–6 pairs, with or without interposed glands; leaflets in 14–30 pairs, oblong obtuse, rather thick, closely and uniformly ranked, 1–1½ lines long. Peduncles 3–5 in each axil, ½ in. long more or less, puberulous, bearing the involucel about the middle. Heads rather few-flowered. "Calyx-teeth short, round, subciliate. Petals united nearly to their ovate-acute apices, more than twice as long as the calyx." Legume straight or but slightly curved, linear, compressed, but little narrowed to the obtuse apex; valves continuous, coriaceous, areolate-venose, glabrous, brown; 1½–3½ in. long, ¼ in. broad.—*A. xiphocarpa*, Hochst. in Hb. Schimp. Abyss. No. 1057.

Nile Land. Nubia, Soturba, *Schweinfurth!* Abyssinia, *Schimper! Dillon and Petit!*

Lower Guinea. Benguella, *Dr. Welwitsch!* (prickles very short, recurved).

The name *A. xiphocarpa* I suppress, regarding the original plant of Hochstetter as identical with *A. abyssinica.*

The *A. xiphocarpa* of the Paris Herbarium and of Hb. Franqueville is *A. etbaica*, Schweinf.

Dr. Welwitsch has a note that this plant is said to afford an excellent gum arabic.

28. **A. tristis,** *Welw. mss.* Tree of 15–20 ft., covered with a grey tomentose-pubescence. Stipular spines very short, conical, glabrous

and shining at the apex or stout terete and elongate. Leaves 2–3 in. long, villose-pubescent, rachis with a concave sessile gland near the base as well as between the upper or all of the pinnæ; pinnæ in 6–11 pairs, leaflets in 10–18 pairs, linear, subacute, 2–2½ lines long. Peduncles axillary, ¼–1 in. long, involucel below the middle or near the base. Flowers capitate. Petals united ¾–⅘ their length, 2–3 times longer than the obtusely 5-toothed pubescent calyx. Legume straight or but slightly curved, compressed, linear, broadly pointed or obtuse, much narrowed at base, 4–6 in. long, scarcely ½ in. broad, in our scarcely ripe specimens; margins continuous or sinuous from abortion, valves pubescent-tomentose obscurely longitudinally nerved.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Apparently near *A. abyssinica* and *A. Sieberiana*.

29. **A. arabica,** *Willd. Sp. Pl.* iv. 1085; *Benth. in Lond. Journ. Bot.* 1842, 500. Tree varying much in size in different districts; extremities glabrous or shortly pubescent-tomentose. Stipular spines straight or nearly so, slender or rather stout below, varying from 0–2 or –3 in. Pinnæ usually in from 3–12 pairs, rachis glabrous or pubescent with or without a sessile gland between the lowest and occasionally 1 or 2 of the upper pairs; leaflets linear-oblong, obtuse, glabrous, or thinly ciliolate, 2–2½ lines long, in 10–30 pairs. Peduncles 2–6 from each upper axil, occasionally somewhat racemose at the extremities, ½–1½ in. long, pubescent, bearing the involucel not far from the middle. Flowers capitate. Calyx shortly and obtusely lobulate. Petals united nearly throughout, twice as long as the calyx. Legume linear, straight or slightly curved, compressed, moniliform, the constrictions usually deep, each article flat or convex, smooth, varying from ½ to over ¾ in. in diameter, valves coriaceous, pubescent-tomentose or glabrous; 4–6 in. long on a stipes of ¼–½ in.—*A. vera*, Willd. l.c. fide Benth. l.c.; *A. nilotica*, Del. Fl. Ægypt. Ill. 31 and Voy. à Méroé, 22 (var. with glabrous fruit); distributed by Hochstetter in Herb. Schimp. under the names *A. abyssinica* and *A. Adansonii*, according to Richard, Fl. Abyss. i. 237; *Hayne, Arzneigewächse*, ix. t. 32.

Upper Guinea. Senegambia, *Heudelot!* and others. Niger, *Barter!*
Nile Land. Abyssinia, *Dillon!* and others. Upper Nile (No. 769), *Speke and Grant!* Nubia, *Dr. Schweinfurth!* Both on the Blue and White Nile.
Lower Guinea. Bumbo, Angola (flower only), *Dr. Welwitsch!*
Mozamb. Distr. Mouth of Zambesi and Rovuma river, *Dr. Kirk!*
Extending eastward through Afghanistan into India; occurring also at Natal (var. *Kraussiana*, Benth.).

On the Upper Nile this species attains a large size, the trunk measuring 8 or 10 ft. in girth (S. and G.). The wood is used in boat-building, and the astringent pods are largely used in tanning. Dr. Schweinfurth states that the quantity of gum afforded (by *A. nilotica*, Del.—the form with glabrous fruit) is trifling, and does not become an article of trade.

30. **A. Kirkii,** *Oliv.* Very nearly allied to *A. arabica*, from which it principally differs in the tuberculate articles of the legume. Spines straight, slender. Pinnæ in 6–8 pairs with a sessile gland between

the lowest and one or two of the upper or all the pairs, rachis pubescent; leaflets in 10–15 pairs, linear, subacute. Inflorescence and bracts as in *A. arabica*. Calyx shortly and obtusely toothed. Petals connate $\frac{3}{4}$ of their length, scarcely twice as long as the calyx. Legume linear, compressed, more or less distinctly moniliform, glabrous, each article with a prominent central tubercle.

South Central. Highlands of Batoka country, *Dr. Kirk!*

31. **A. Seyal,** *Delile, Fl. d' Egypte*, 142, t. lii. 2. A small or medium-sized tree; extremities glabrous or obsoletely puberulous; bark brown or reddish-brown (milk-white in *var. fistula*). Stipular spines patent, 1–2 in. long, rather slender, at length ivory-white, toward the extremity of flowering branches frequently very short, recurved. Leaves glabrous; pinnæ in 3–9 pairs; rachis usually with at least one gland; leaflets linear-oblong obtuse, in 8–20 pairs, $1\frac{1}{2}$–$2\frac{1}{2}$ lines long. Peduncles 1–5 from each node, occasionally shortly panicled or racemose, $\frac{3}{4}$–$1\frac{1}{2}$ in. long, glabrous, bearing the deciduous involucel below the middle. Flowers capitate. Calyx-teeth short, obtuse. Petals united $\frac{3}{4}$ their length or more, twice as long as the calyx. Legume linear, falcate, slightly but distinctly broadly constricted between the longitudinally disposed seeds, narrowed at each end; valves coriaceous, longitudinally areolate-nervose, 3–6 in. long, $\frac{1}{6}$–$\frac{1}{4}$ in. broad.—*A. Giraffæ*, Sieb. Herb. Seneg.

Upper Guinea. Senegambia, *Sieber! Lelieur!*

North Central. Forming woods of enormous extent between the 12th and 16th parallels, and occurring in isolated examples in dry stony places (not in sand) from the Black Mountains (29° N. lat.) to Kouka, *E. Vogel!*

Nile Land. Abyssinia, *Schweinfurth!* Upper Nile, 9° N. lat. (767.7), *Speke and Grant!* Nubia, *Dr. Schweinfurth!*

Mozamb. Distr. Manganya hills, Zambesi land, *Dr. Meller!*

Var. *fistula* (*A. fistula*, Schweinf. in Acacien-arten d. Nilgebiets, 344, t. 11–13). Branches with a smooth milk-white bark. Leaflets often $\frac{1}{3}$ in. long. Legumes as in the type, $\frac{1}{4}$–$\frac{1}{3}$ in. broad.

Nile Land. Matamma, *Dr. Schweinfurth!* who also cites it as occurring in Sennaar, and forming woods in Southern Nubia. The stipular spines are very subject to a monstrous dilatation at the base, owing to insect-puncture. I should scarcely have reduced this plant to *A. Seyal*, were it not that we possess a specimen connecting the forms in the collection of Speke and Grant.

32. **A. stenocarpa,** *Hochst.; A. Rich. Fl. Abyss.* i. 238. Tree; extremities brownish or red-brown, glabrous or minutely puberulous. Stipular spines usually very short, straight or obsolete. Leaves glabrous or glabrescent, rachis with at least a conspicuous sessile gland near the base; pinnæ in 4–10 pairs; leaflets linear-oblong, somewhat pointed, 1–$2\frac{1}{2}$ lines long, in 10–20 pairs. Peduncles $\frac{1}{2}$–1 in. long, 1–5 from each axil, or in short terminal or axillary leafless racemes, glabrous or puberulous, with a conspicuous early separating involucel near the base or towards the middle. Flowers capitate. Calyx obtusely dentate. Petals connate nearly throughout. Legume narrow-linear, flat, falcate or curved nearly to a circle, scarcely or not at all constricted between

the seeds; valves thinly coriaceous, finely longitudinally nerved, puberulous, 4 in. long, $\frac{1}{6}$ in. broad.—*A. Giraffæ?* Hochst. in Hb. Schimp. Abyss.; Schweinf. Acacien-arten d. Nilgebiets, 355, t. 17, 18.

Nile Land. Abyssinia, *Schimper!* Nubia, *Dr. Schweinfurth!* White Nile, *Consul Petherick!* Madi (No. 677), and perhaps also Karaguè valley (384), *Speke and Grant!*

One of the species affording the gum arabic of commerce (*Dr. Schweinfurth*, Acacien-arten d. Nil. 357).

33. **A. Ehrenbergiana,** *Hayne, Arzneigewächse*, ix. 29. A shrub; extremities smooth, shining, chestnut-brown. Stipular spines usually exceeding the leaves, slender, spreading, straight. Leaves small, puberulous or glabrate; pinnæ 1–2-jugate, leaflets 8–10-jugate, oblong, obtuse, midrib obscure, 1–1$\frac{1}{2}$ lines long. Flowers capitate. Peduncles solitary or fascicled in the axils, exceeding the leaf, bearing the involucel near or below the middle. Petals united $\frac{2}{3}$ their length, twice as long as the calyx. Legume narrow-linear, falcate, broadly constricted between the seeds, varying to 4$\frac{1}{2}$ in. in length.—Schweinf. Acacien-arten d. Nilgebiets, 352, t. 15, 16.

Nile Land. Abyssinia, Nubia, *Dr. Schweinfurth.*

Also in Egypt and Arabia.

I have not certainly identified this plant in the Kew Herbarium. The description is taken from Dr. Schweinfurth's memoir. The Arabian plant of Fischer, No. 73 (not 37 as cited by Mr. Bentham and Dr. Schweinfurth), agrees well with *A. Ehrenbergiana* as figured. The legume of *A. Jacquemontii*, Benth., is very different.

34. **A. spirocarpa,** *Hochst.; A. Rich. Fl. Abyss.* i. 239. A low tree; extremities red-brown, pubescent. Stipular spines patent, straight, slender, varying in length to 2$\frac{1}{2}$ in. occasionally on the same branch, very short, hooked, or obsolete. Leaves in our specimens very short, $\frac{1}{2}$–1$\frac{1}{2}$ in. long, petioles pubescent; pinnæ in 4–10 pairs; leaflets very small, oblong, in 7–15 pairs. Peduncles 1 or few, axillary, $\frac{1}{4}$–$\frac{1}{2}$ in. long, bearing the minute involucel below or near the middle. Flowers capitate. Legume spirally twisted or contorted, linear, compressed, slightly constricted between the seeds, valves coriaceous, longitudinally nerved, pubescent or puberulous, 3–6 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad.—Schweinf. Acacien-arten d. Nilgebiets, 322, t. 4, 5, 6.

Nile Land. Abyssinia, *Schimper!* Nubia, *Dr. Schweinfurth!* Sennaar and Kordofan, *Dr. Schweinfurth.*

Dr. Schweinfurth thinks Delile's *A. gummifera* (Voy. à Méroé, 21) may be this species. It is very imperfectly described.

So far as I can judge from the description, *A. Petersiana*, Bolle in Peters' Mossamb. Bot. i. 4, must be very near to *A. spirocarpa*. The fruit, however, is unknown. The leaves are described as hairy, not exceeding 1 in. in length, with 10 pairs of pinnæ, leaflets very small, linear, in 6–20 pairs. The involucel is inserted on the lower part of the peduncle.

35. **A. tortilis,** *Hayne, Arzneigewächse*, ix. 31; *Schweinf. Acacien-arten d. Nilgebiets*, 327. A tree; wholly glabrous, the extremities brown or reddish-brown. Stipular spines on the flowering branches very short, slightly recurved, "on barren branches 1 in. long, straight." Pinnæ in 2–5 pairs, glands of the rachis when present very minute;

leaflets in 8–12 pairs, linear-oblong, obtuse, $1\frac{1}{2}$–$3\frac{1}{2}$ lines long. Peduncles 1–5 from each axil, slender, bearing a small involucel near or a little below the middle. Flowers capitate. Calyx-teeth short. Petals twice as long as calyx. Legume flat, coriaceous, narrow-linear, spirally twisted, rather strongly longitudinally nerved, glabrous, 3–6 in. long, $2\frac{1}{2}$–3 lines broad.—*A. fasciculata*, Guill. et Perr. Fl. Seneg. i. 252; Benth. in Hook. Journ. Bot. 1842, 502. *A. Raddiana*, Savi, Acacie Egiziane, i. (fide *Schweinfurth*).

Upper Guinea. Senegambia, *Heudelot!*
Nile Land. Nubia, *Dr. Schweinfurth.*
Also in Egypt! and Arabia..

DOUBTFUL SPECIES WITH SPICATE FLOWERS.

A. Rovumæ, *Oliv.* Extremities puberulous. Infrastipular spines short, scarcely recurved in our specimen. Leaves 4–6 in. long, pubescent or puberulous, rachis with a sessile gland towards the base; pinnæ 7–9-jugate, leaflets 15–30-jugate, oblong obtuse, sometimes obliquely mucronulate, $\frac{1}{6}$–$\frac{1}{4}$ in. long, about 1 line broad. Spikes axillary, equalling or shorter than the leaf; flowers sessile. . . . . Legume linear-oblong, compressed, straight, 4–6 in. long, nearly 1 in. broad; valves glabrous, coriaceous, dark-brown, very obscurely veined; seeds 6–10.

Mozamb. Distr. Rovuma Bay, *Dr. Kirk!*

Acacia, *sp. n.?* Dr. Meller collected in the Manganya hills, Zambesi land, specimens of a "fine tree," with tenacious but not hard wood, which may prove a new Acacia. As we have no fruit, and it does not present marked characters, I do not name it. Extremities bluish-black, glabrous, glaucescent, with or without short recurved infrastipular spines. Leaves 4–6 in. long, glabrous, with a sessile gland towards the base of the rachis; pinnæ in 5–7 pairs, leaflets 7–10-jugate, oblanceolate oblong, 4–5 lines long. Spikes 2 or 3 from the axils. Flowers subsessile, glabrous. Calyx acutely toothed; petals but slightly longer.

Acacia, *sp.* Tree of 20–25 ft.; extremities and petioles obscurely pubescent. Infrastipular spines short, recurved. Pinnæ 7–9 jugate, leaflets 11–14-jugate, oblong subfalcate, $\frac{1}{4}$ in. long. Spikes axillary. Flowers . . . . Legume (immature) flat, straight, margins parallel or sinuous from abortion, abruptly apiculate, 5–6 in. long, 1 in. broad.

Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Evidently belongs to the difficult set including *A. Catechu, Caffra,* and *hecatophylla,* the relations of which I feel uncertain about.

DOUBTFUL SPECIES WITH CAPITATE FLOWERS.

A. Adansonii, *Guill. et Perr. Fl. Seneg.* i. 249. A much branched tree of 30–40 ft.: extremities shortly and densely pubescent. Stipular spines straight, divaricate. Leaf-rachis with a gland between the upper and lower pairs of pinnæ; pinnæ 4–6-jugate; leaflets 12–16 jugate, very small, linear-oblong. Flowers capitate, yellow; peduncles axillary, short, geminate or ternate. Petals united nearly throughout, twice as long as the infundibuliform pilose calyx. Legume linear-oblong, slightly incurved, compressed, margin continuous or undulate (not moniliform), valves thick, brown, minutely pubescent, 5–6 in. long, $\frac{2}{3}$–$\frac{3}{4}$ in. broad, 8–12-seeded.

Upper Guinea. Senegambia, *Guillemin and Perrottet.*
I have not seen an authentic specimen of this plant, and as I have not identified it in any specimens at Kew, I copy the description. Mr. Bentham, in Hook. Journ. Bot. 1842, 497, under the same name describes a plant which is probably different, having 10–20-jugate pinnæ, and 20–30-jugate leaflets. Both Mr. Bentham and Messrs. G. and P. reduce *Mimosa adstringens,* S. and T. Guin. Pl. 327, to this species.

The astringent fruits are collected for use in tanning.

A. verugera, *Schweinf. Acacien-arten d. Nilgebiets*, 340, *tabb.* 9, 10. Tree attaining 60 ft.; branches terete with a grey or greenish-grey bark, wholly glabrous. Stipular spines long, slender, straight and spreading. Leaves 2 in. long, more or less subglaucous, glabrous; pinnæ in 7–8 pairs, leaflets linear-oblong obtuse, in 20–30 pairs, 1–1½ lines long. Peduncles ½–1 in. long, in axillary fascicles of 4–8, occasionally from short lateral racemes; involucel minute, usually above the middle of the peduncle. Flowers capitate. Calyx-teeth short. Petals united ¾ of their length. Ovaries subsessile, glabrous. Legume unknown.

Nile Land. Southern Nubia, Fesoghlu, and on the Upper White Nile, *Dr. Schweinfurth!*

In the last-received collections (1863–8) of Schimper from Abyssinia, are fruiting specimens which may belong to this species, certainly to no other here described from that country. The extremities are pubescent, the leaf-rachis thinly so, the leaflets 2 lines long, and the legumes nearly straight oblong, 2-valved, with rather thick coriaceous nearly smooth valves, 4 in. long, 1 in. or a little more in width; like those of *A. abyssinica* on a large scale.

Mr. Baines collected in South Tropical Africa (locality not given) an *Acacia* in fruit, which may be new. The fruits are detached, and there is nothing to show whether the inflorescence is capitate or spicate. The extremities, slender straight stipular spines and leaves are glabrous. Pinnæ 1–3-jugate, leaflets 8–14-jugate, oblong obtuse, coriaceous; leaf-rachis very short, not exceeding ¼–½ in., with minute glands depressed in the centre between the pinnæ. The legumes are scimitar-shaped, much recurved at the apex, 3–5 in. long, ¾–1 in. broad a little above the middle, thence gradually tapered to each end; valves flat, coriaceous, covered with a dense grey tomentum.

15. **CALLIANDRA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 596.

Flowers capitate, polygamous, 5–6-merous. Calyx campanulate, toothed or 5-fid. Petals united to about the middle. Stamens indefinite, filaments filiform, much exserted, more or less connate at the base; anthers minute, glandular-hairy or glabrous, "pollen cohering in 2 or 4 masses in each cell." Ovary sessile or subsessile, multiovulate, style filiform. Legume flat, straight or nearly so, linear, narrowed at the base, 2-valved, continuous with prominent sutural margins, valves coriaceous, separating elastically longitudinally from apex to base.—Shrubs or small trees, usually unarmed. Leaves bipinnate. Stipules persistent. Peduncles axillary, solitary or collected in racemes.

A considerable Tropical American genus, with a solitary representative in Asia. The following plant appears identical, so far as it goes, with a common American species. It may be an accidental introduction. I have not seen the African plant in fruit.

1. **C. porto-ricensis,** *Benth. in Hook. Journ. Bot.* 1844, 99. Shrub, with slender, terete, somewhat virgate, glabrous branches. Leaves glabrous, or rachis (of ½–3–4 in.) puberulous; pinnæ 2–4-jugate; leaflets linear-oblong, very oblique at base, broadly pointed, sessile, ¼–½ in. long more or less, in 8 or 10 to upwards of 30 pairs. Stipules oblong-lanceolate, persistent. Peduncles very slender at first, axillary or collected in lateral or terminal leafless racemes. Legume 2–3 in. long, ¼ in. broad, much narrowed at base, obtuse, often mucronate; valves abruptly and transversely depressed between the seeds when ripe; the sutural margins prominent continuous.—*Acacia porto-ricensis,*

Willd. DC. Prod. ii. 467. *Mimosa guineensis*, Schum. et Thonn. Pl. Guin. 323 (fide *Fl. Nigrit.* 332).

Upper Guinea. Bonny river, *Mann!*
Widely spread in the West Indies, and opposite shores of the mainland.

16. **ALBIZZIA**, Durazz.; Benth. et Hook. f. Gen. Plant. i. 596.

Flowers capitate (in African species), sessile, or shortly pedicellate, usually 5-merous. Calyx tubular to campanulate, toothed. Petals 5–4, united $\frac{1}{2}$ their length or more, valvate. Stamens indefinite, exserted; filaments united at the base only or in a long exserted sheath (§ *Zygia*); anthers minute, "pollen cohering in 3–4 masses in each cell." Legume straight, flat, oblong or broadly linear, indehiscent or 2-valved, valves usually thin, continuous or sinuous from abortion of seeds. Seeds compressed, usually subdistant.—Trees or shrubs, unarmed. Leaves bipinnate; leaflets various; rachis frequently with 1 or more sessile glands. Stipules rarely conspicuous. Peduncles axillary, solitary or usually fascicled towards the extremities. Stamens elongate.

A considerable genus of the Old World. With two or three exceptions the following species appear to be peculiar to Africa. The clavis to the species here given must be used with caution. Several species which appear distinct do not afford much contrast in brief diagnoses.

Staminal sheath included.

Leaflets rarely exceeding $\frac{1}{2}$ in., 18–40-jugate; pinnæ 7–20-jugate.
- Leaflets $\frac{1}{3}$–$\frac{1}{2}$ in. long, linear oblong, pubescent . . . . 1. *A. Julibrissin*, var.
- Leaflets $\frac{1}{8}$–$\frac{1}{6}$ in. long, linear, obtuse, silky . . . . . 2. *A. amara.*
- Leaflets $\frac{1}{4}$ in. linear-falcate, acute, thinly silky . . . . 3. *A. hypoleuca.*

Leaflets, at least the upper, 1–2 in. long, 2–10-jugate, more or less oblique; pinnæ 2–4-jugate.
- Leaflets 2–3-jugate, glabrous; pinnæ 2–3. Legume 2–6 in. × $\frac{1}{3}$–$\frac{3}{4}$ in. . . . . 4. *A. anthelmintica.*
- Leaflets 4–6-jugate, glabrate; pinnæ 2–1 . . . . . 5. *A. glabrescens.*
- Leaflets 4–6-jugate, glabrescent; pinnæ 2–3 . . . . . 6. *A. rhombifolia.*
- Leaflets 3–5-jugate, glabrous; pinnæ 2–6 . . . . . 7. *A. glaberrima.*
- Leaflets 3–9-jugate, glabrous; pinnæ 2-4. Legume $\frac{1}{2}$–1 ft. × 1–1$\frac{3}{4}$ in. . . . . 8. *A. Lebbek.*
- Leaflets 3–6-jugate, pubescent; pinnæ 2–4. Legume 4–10 in. × 1$\frac{1}{2}$–2 in. . . . . 9. *A. versicolor.*

Leaflets $\frac{1}{2}$–1 in. long, 5–20-jugate; pinnæ 3-7-jugate.

Midrib oblique.
- Leaflets 11–20-jugate (lower lateral vein directed forwards; pinnæ 4–5 . . . . . 10. *A. Schimperiana.*
- Leaflets 8–12 (or more)-jugate; pinnæ 8 . . . . . *A. elliptica* (p. 360)

Midrib parallel with the margins of leaflet.
- Leaflets glabrate, $\frac{1}{2}$–$\frac{3}{4}$ in.; pinnæ 5–7. Flowers $\frac{1}{4}$ in. . 11. *A. pallida.*
- Leaflets thinly pubescent, $\frac{3}{4}$–1 in.; pinnæ 6–7 . . . 12. *A. Quartiniana.*
- Leaflets glabrate, $\frac{1}{2}$–1 in.; pinnæ 3–6. Flowers 5 lines (calyx often circumsciss) . . . . . 13. *A. coriaria.*
- Leaflets pubescent, $\frac{1}{2}$–$\frac{3}{4}$ in.; pinnæ 3–5. Flowers $\frac{1}{3}$–$\frac{1}{2}$ in. Petals twice as long as calyx. Legume 9–10 in. × 1$\frac{3}{4}$–2 in. broad . . . . . 14. *A. angolensis.*
- Leaflets pubescent, $\frac{1}{2}$–$\frac{2}{3}$ in.; pinnæ 3–6. Flowers $\frac{1}{3}$–$\frac{1}{2}$ in. Petals 2$\frac{1}{2}$–3 times as long as calyx. Legume 4$\frac{1}{2}$–6 in. × $\frac{3}{4}$–1 in. broad . . . . . 15. *A. ferruginea.*

Staminal sheath much exserted (central flower of head often diverse with short staminal sheath—§ *Zygia*).
Leaflets 8–15-jugate; pinnæ 4–7.
Calyx about ½ line long . . . . . 16. *A. brachycalyx.*
Calyx 1½–2 lines long . . . . . 17. *A. fastigiata.*
Leaflets 3–8-jugate; pinnæ 2–5.
Leaflets ⅓–½ in. or upper 1 in. long, obovate-rhomboid . . 18. *A. Petersiana.*
Leaflets 3–4-jugate, 1–3 in. long; pinnæ 2–3 . . . . 19. *A. Brownei.*
Leaflets 4–8-jugate, ¾–2 in. long; pinnæ 3–5 . . . . 20. *A. Welwitschii.*

1. **A. Julibrissin,** *Boivin; Benth. in Hook. Journ. Bot.* 1844, 91. Tree of medium size; extremities glabrous or puberulous. Leaf-rachis ½–1 ft. long, frequently with small interjugal glands above, as well as one near the base; pinnæ 7–12-jugate; leaflets multijugate (20–40-jugate), linear-oblong, subfalcate, acute, obliquely apiculate or obtuse, finely pubescent or glabrate, ⅓–½ in. long. Flowers sessile or pedicellate, in pedunculate heads fascicled in the upper axils or racemose, silky-pubescent in the African form. Calyx infundibuliform, with 5 deltoid teeth. Petals connate two-thirds, nearly three times as long as calyx. Filaments irregularly connate at the base, tube included. Legume straight, 4–6 in. long, ¾ in. more or less broad, margins continuous or sinuous only from abortion of seeds.—var. *mollis*, Benth. l. c. *Albizzia mollis*, Boivin ex. Benth.; *Acacia Isenbergiana*, Schimp. Pl. Abyss. No. 275; Fournier in Ann. Sc. Nat. sér. iv. 14, 373. *Inga*, A. Rich. Fl. Abyss. i. 236.

Nile Land. Abyssinia, Lake Amba! Occurring on the mountains rarely, and in isolated specimens, according to a note on the specimen communicated by Capt. Pullen. Dr. Schimper's specimen is from a planted tree, and on its label he queries if it be introduced.

Apparently widely spread in Central and Southern Asia.

2. **A. amara,** *Boivin; Benth. in Hook. Journ. Bot.* 1844, 90. Tree with rather stout interrupted or nodose extremities, at first shortly tomentose-pubescent. Leaves undeveloped at flowering, rachis primary and secondary closely pubescent, the former 3–5 in. long; pinnæ 10–20-jugate, leaflets closely 25–35-jugate, linear, subobtuse, sparsely sericeous, 1½ lines long. Flowers capitate, sessile or subsessile, silky; peduncles ½–1 in. long, usually fascicled in the nodes of short lateral branches. Calyx shortly and obtusely dentate. Petals united ⅔, 2–3 times exceeding the calyx. Filaments irregularly confluent at base, the tube included. Legume linear-oblong, nearly straight, puberulous or glabrate, often sinuous from abortion of seeds, usually 5–8 in. long, ¾–1½ in. broad.—*Acacia sericocephala*, Fenzl in Flora, 1844, 312; Schweinf. Reliq. Kotschyanæ, vi. t. 5, 6; Benth. in Hook. Journ. l. c. 91. *Albizzia affinis*, Fourn. in Ann. Sc. Nat. sér. iv. 14, 371.

Nile Land. Abyssinia, *Schimper!* Sennaar and Kordofan, *Kotschy!*
Also in India.

A. affinis was specifically distinguished by M. Fournier on the ground of its longer and broader legume, but our specimens do not support its separation.

3. **A. hypoleuca,** *Oliv.* About 10 ft. in height; young shoots, petioles, and peduncles pubescent. Leaves 4–5 in., rachis with a small

sessile gland near the base and between the uppermost pinnæ; pinnæ 10–13-jugate; leaflets in about 20 pairs, linear falcate acute, very pale and thinly silky beneath, $\frac{1}{4}$ in. long. Peduncles slender, fascicled in the upper axils, 2 in. long more or less. Flowers pubescent, sessile. Bracteoles linear-subulate. Calyx $\frac{1}{3}$–fid, teeth lanceolate-deltoid. Petals connate half their length. United base of the capillary filaments included.—*A. pallida,* Harv. in Flor. Cap. ii. 284 (non *Fournier*).

South Central. Near Lake Ngami, *M'Cabe!*

4. **A. anthelmintica,** *A. Brongn. in Bull. Soc. Bot. France,* vii. 902. A shrub or small tree (in Zambesi land occasionally with a trunk 3–4 ft. in diameter), wholly glabrous or extremities petioles and peduncles in the Zambesi plant minutely pubescent. Leaf-rachis $\frac{1}{2}$–3 in. long, usually with minute glands; pinnæ 2–3- (1–4) jugate; leaflets 2–3-(–5) jugate, the upper larger, obliquely obovate or obovate-elliptical, obtuse, mucronate, glabrous, glaucescent, reticulate, paler or glaucescent beneath, the upper varying to $1\frac{3}{4}$ in. in length, usually smaller, petiolule $\frac{1}{2}$ line or less. Peduncles fascicled or solitary in the upper axils or from leafless nodes on the older wood, about $\frac{1}{2}$ in. long. Flowers "whitish," subsessile on pedicels $\frac{1}{20}$ in. Calyx infundibuliform, denticulate, at length irregularly split, half as long as petals which are connate $\frac{2}{3}$. United base of the filaments included. Legume 2–6 in. long, few-seeded, narrowed at the base, often sinuous from abortion of seeds, $\frac{1}{3}$–$\frac{3}{4}$ in. broad in our specimens.—*Besenna anthelmintica,* A. Rich. Fl. Abyss. i. 253; Fournier, Thèse Inaug. cum. tab.; *Albizzia floribunda* (Fenzl) Kotschy, Schweinf. in Reliq. Kotsch. 5, t. 4.

Nile Land. Abyssinia, *Petit! Schimper!* and others.
Lower Guinea. Bumbo, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Shire river, Zambesia, *Dr. Meller!*
The bark is used as an anthelmintic in Abyssinia. "Wood hard, and used in canoe-making" in Zambesi land. (*Dr. Meller.*)

5. **A. glabrescens,** *Oliv.* A large tree; extremities minutely rusty-pubescent, early glabrous or nearly so, lenticellate, dark reddish brown. Leaf-rachis 1–3 in., glabrate, eglandular (in our specimens); pinnæ 2–1-jugate; leaflets 4–6-jugate, shortly petiolulate, oblique or subfalcate, oblong-rhomboidal or ovate-lanceolate, obtuse, the uppermost pair largest, glabrous or midrib puberulous above, shining, reticulate, with the lower lateral nervure prolonged $\frac{1}{2}$ the length of the leaflet, varying to 2 in. in length, the lower frequently not half as long; petiolule $\frac{1}{2}$ line. Peduncles 1 in., fascicled in the nodes and racemosely or corymbosely crowded on leafless shoots 2–3 in. in length. Inflorescence pubescent more or less. Pedicels equalling the calyx or flower. Calyx tubular-campanulate, 5-dentate, 1 line long. Petals united $\frac{3}{4}$, twice as long as the calyx. United base of the filaments included.

Mozamb. Distr. Zanzibar; and Kongone, Zambesi, growing in open spaces between the lines of mud creeks, *Dr. Kirk!*

6. **A. rhombifolia,** *Benth. in Hook. Journ. Bot.* 1844, 87. A small tree; extremities at first rusty-puberulous early glabrous, striate. Leaves as broad as long, rachis puberulous, 2–3 in. long, with a sessile gland between each of the 2 or 3 pairs of pinnæ, and between all or most of the leaflets; leaflets 4–6-jugate, obliquely elliptic-oblong or subrhomboid, obtuse, glabrous at length or obscurely ciliolate, rather coriaceous, reticulate, the upper rather larger, 1–1½ in. long, ¾ in. more or less broad, subsessile. Flowers glabrous, "white," shortly pedicellate; heads on erect axillary, solitary or fascicled peduncles 3–4 in. long; pedicels 1–2 lines. Calyx rather broadly infundibuliform, 5-fid, with ovate teeth. Petals united ½–⅔ their length, minutely hairy above, externally scarcely twice as long as the calyx. United base of the filaments included, adnate below to the petals. Ovary hairy, stipitate.

Upper Guinea. Senegambia, *Heudelot!*

A single pinna, which may belong to this species, occurs in Speke and Grant's collections (No. 760).

7. **A. glaberrima,** *Benth. in Hook. Journ. Bot.* 1844, 88. Tree of medium size; extremities at first pubescent. Pinnæ 2–6-jugate; leaflets 3–5-jugate, obliquely rhomboid-obovate, subacute, reticulate, glabrous, 1 in. long, more or less. Peduncles axillary, solitary or fascicled, 1½ in. long. Flowers capitate; pedicels as long as flower. Calyx tubular-campanulate, 5-toothed. Petals twice as long as calyx, 5-fid, whitish. Staminal tube included.—*Mimosa glaberrima*, Schum. et Thonn. Pl. Guin. 321.

Upper Guinea. *Thonning.*

Description from Schumacher and Thonning. As Mr. Bentham suggests, this plant may be conspecific with *A. rhombifolia.* The differences between them, though slight, hardly justify me in uniting them without a sight of Thonning's specimen.

8. **A. Lebbek,** *Benth. in Hook. Journ. Bot.* 1844, 87. Tree; extremities wholly glabrous or puberulous. Leaf-rachis 3–9 in., with a large sessile gland near the base, with usually one or more interjugal glands; pinnæ usually 2–4-jugate, leaflets 3–9-jugate, elliptic-oblong, or the upper more oblique and obovate-oblong, very obtuse or retuse, subsessile, glabrous, reticulate, 1–2 in. long, ½–¾ in. broad. Peduncles 2–4 in., fascicled from the upper axils or corymbose; flowers glabrate or puberulous, capitate, on pedicels of 1–3 lines. Calyx 1½–2 lines long, with short deltoid teeth. Free extremities of petals ovate-lanceolate. United base of the filaments included. Legume ½–1 ft. long, 1–1¾ in. broad.—*Acacia Lebbek*, Willd. Sp. Pl. iv. 1066. For further synonymy see Mr. Bentham's paper cited above.

Upper Guinea. Said to be indigenous on the Gambia. Specimens from Senegambia and Fernando Po are in the Kew Herbarium.

Nile Land. Frequently planted; Khartoum, 773, *Speke and Grant!* No. 764 of Speke and Grant's collection, I cannot distinguish from *A. Lebbek.*

Mozamb. Distr. Near the coast-line, *Dr. Peters.*

Sent home by collectors from various localities in tropical and subtropical Asia.

9. **A. versicolor,** *Welw. mss.* Small tree; extremities peduncles and petioles shortly and closely rusty- or tawny-pubescent or tomentose. Leaf-rachis 2–3½ in. or 6–8 in. on barren shoots, with a sessile gland near the base, and frequently 1 or 2 interjugal glands, with glands occasionally on the partial peduncles; pinnæ 2–4-jugate; leaflets 3–6-jugate, minutely petiolulate, the upper larger, 1½–2 in. long, 1–1½ in. broad, obliquely obovate elliptical, or the lower rotundate, obtuse, submucronate, pubescent above, pubescent or tomentose beneath. Flowers subsessile in many-flowered heads on fascicled peduncles of 1½–2½ in. Calyx tubular-infundibuliform ¼ in. long, with lanceolate teeth. Petals "whitish," twice or scarcely twice as long as calyx, connate ½ their length. United base of filaments included. Ovary shortly silky. Legume flat, straight, very obtuse, usually minutely apiculate, 4–10 in. long, 1½–2 in. broad, valves thin, almost papery.

Lower Guinea. Golungo Alto and Zenza do Golungo, Angola, *Dr. Welwitsch!*
Mozamb. Distr. Maravi country, west of Lake Nyassa, 3000 ft., *Dr. Kirk!*

10. **A. Schimperiana,** *Oliv.* Extremities finely pubescent, at length nearly glabrous. Leaf-rachis pubescent, 3–4 in. on flowering branches, with a small gland near the base and between the uppermost pinnæ; pinnæ 4–5-jugate; leaflets 11–20-jugate on the median and upper pinnæ, oblong subfalcate and obliquely pointed at the apex, midrib distinctly excentric with the basal veins on the lower side directed forwards, glabrate and almost veinless above, pale and obsoletely sericeous beneath, 5–8 lines long, 2–3 lines broad. Inflorescence capitate on axillary peduncles of 1–1½ in. Flowers not seen. Legume (scarcely mature) very thin, ½ ft. long more or less, 1–1⅓ in. broad, rather abruptly narrowed at the base into a stipes of ½–¾ in.

Nile Land. Abyssinia, *Schimper* (1863–68), No. 1396!

11. **A. pallida,** *Fournier in Ann. Sc. Nat. sér.* 4, ii. 375. Tree, with extremities young leaves and peduncles tawny-pubescent. Characters generally of *A. ferruginea*, to which it is very nearly allied. Leaf-rachis ½–¾ ft., furrowed below when dry; pinnæ 5–7-jugate; leaflets of *A. ferruginea* in form and nervation, glabrous above, obsoletely pubescent and much paler beneath. Inflorescence as in *A. ferruginea*; the flowers ¼ in. long, especially towards the margin of the calyx and back of the petals silky-tomentose. Calyx obtusely 4–5-dentate. Petals 4 or 5, not more than twice as long as calyx. Staminal sheath included. Ovary subglabrous. Legume not seen.—*Acacia malacophylla*, Steud. in Pl. Schimp. Abyss. 1578. (*Inga*, A. Rich. Fl. Abyss. i. 235, in part.)

Nile Land. Abyssinia, *Schimper!*

12. **A. Quartiniana,** *Walp. Ann.* ii. 457. Very nearly allied to *A. ferruginea* and *A. pallida*. I have seen but an imperfect fruiting specimen, and from the published descriptions I cannot gather that flowers have been seen. Leaf-rachis ½–¾ ft., glabrate; pinnæ in 6–7

pairs or fewer; leaflets in form and nervation as in *A. ferruginea*, thinly pubescent on both sides, paler beneath, $\frac{3}{4}$–$\frac{5}{6}$ in. long. Inflorescence capitate. Legumes (immature) straight, $\frac{1}{2}$ ft. long (10 in. *Fournier*), $\frac{3}{4}$–$\frac{5}{6}$ in. broad, narrowed at the base into a short stipes, minutely or obsoletely puberulous.—*Inga Quartiniana*, A. Rich. Fl. Abyss. i. 235.

Nile Land. Abyssinia, *Quartin-Dillon!*

M. Fournier describes, in Ann. Sc. Nat. sér. 4. xiv. 374, *A. elliptica*, Fourn., between *A. Quartiniana* and *A. pallida*. Leaves nearly 2 ft. long, rachis reddish puberulous with a conspicuous gland near the base, and others between the upper pinnæ; pinnæ 8-jugate; leaflets in 8–12 or more pairs, elliptical with an oblique midrib, mucronulate, puberulous, pale and villous beneath. Flowers villous, capitate on elongate puberulous peduncles. Calyx tubular-campanulate, 5-dentate. Petals twice as long as calyx. Legume 3–4 in. long, 1 in. broad, subglabrous.

Abyssinia, *Schimper* (1854), No. 1087. I have not seen a specimen.

13. **A. coriaria,** *Welw. mss.* Tree of small or medium size; extremities, petioles, and peduncles rusty-pubescent or puberulous, sometimes thinly and early glabrescent. Leaf-rachis 2–9 in., with a sessile gland towards the base, with or without interjugal glands above; pinnæ 3–6-jugate; leaflets 6–11-jugate, elliptic-oblong, obtuse on short stout petiolules of $\frac{1}{2}$ line or less, glabrous or glabrate, subreticulate with a nearly median nervure, usually $\frac{2}{3}$ in. ($\frac{1}{2}$–1 in.) long. Peduncles $1\frac{1}{2}$–3 (4) in. from the upper axils or fascicled in the upper leafless nodes, forming terminal corymbs. Flowers capitate, 5 lines long, sessile. Calyx tubular or scarcely dilated above, unequally toothed, $\frac{1}{6}$ in. long, puberulous, the tube frequently early circumsciss at the base (at its union with the disk). Bracteoles shorter than calyx, caducous in early bud. Petals connate $\frac{3}{4}$, twice as long as calyx, "sulphur yellow." Staminal tube included, nearly equalling petals; free filaments exserted 1 in. or more. Legume flat as in *A. Lebbek*, 5–8 in. long, $1\frac{1}{6}$–$1\frac{1}{2}$ in. broad, straight, apiculate.

Lower Guinea. Golungo Alto and Cazengo, Angola, *Dr. Welwitsch!*

Nearly allied to *A. Lebbek*, in which, however, the flowers seem to be always pedicellate, the calyx more infundibuliform and never, that I have seen, circumsciss at the base, the pinnæ and leaflets generally more numerous, and the legume not so long.

14. **A. angolensis,** *Welw. mss.* Tree of 30–40 ft. with a trunk 1–$2\frac{1}{2}$ ft. in diameter; extremities, petioles, and peduncles shortly rusty-pubescent. Leaf-rachis 3–6 in., usually with 1 or 2 sessile glands; pinnæ 3–5-jugate; leaflets 5–13-jugate, oblong, obtuse, pubescent on both sides, sessile, nervure median; $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{6}$–$\frac{1}{3}$ in. broad, the uppermost pair frequently smaller than the rest below. Peduncles $1\frac{1}{2}$–3 in. from the upper axils or corymbose, and overtopped by the leaves at the extremities; bracteoles linear, narrowed below, tomentose, as long as or longer than the calyx, caducous or subpersistent. Flowers $\frac{1}{3}$–$\frac{1}{2}$ in. long, rusty-pubescent, whitish passing into yellow; subsessile. Calyx $\frac{1}{6}$ in. long, toothed. Petals twice as long as calyx. United base of filaments included. Legume flat, straight, 9–10 in. long, $1\frac{3}{4}$–2 in. broad, very obtuse, apiculate; valves thin.

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

15. **A. ferruginea,** *Benth. in Hook. Journ. Bot.* 1844, 88. Tree of small or medium size; extremities leaves and peduncles rusty- or tawny-pubescent or -tomentose. Leaf-rachis firm, 2–5 in. on flowering branches, with a sessile often conspicuous gland near the base; pinnæ 3–6-jugate; leaflets 8–16-jugate, oblong obtuse, entire or mucronulate, pubescent on both surfaces, paler beneath, nervure median, penniveined from the base; $\frac{1}{2}$–$\frac{2}{3}$ in. long, $\frac{1}{6}$–$\frac{1}{3}$ in. broad. Flowers capitate, subsessile, on pedicels not exceeding 1 line, more or less silky. Calyx tubular-infundibuliform, 5-toothed. Petals united $\frac{1}{2}$–$\frac{2}{3}$ their length, $2\frac{1}{2}$–3 times longer than the calyx. United base of filaments included. Legume straight, broadly linear, obsoletely puberulous, $4\frac{1}{2}$–6 in. long, $\frac{3}{4}$–1 in. broad.—*Inga ferruginea,* Guill. et Perr. Fl. Seneg. i. 236. *Albizzia malacophylla,* Walp. Ann. ii. 457; Fournier in Ann. Sc. Nat. sér. 4, xiv., 376. (*Acacia,* Steud. in Pl. Schimp. Abyss. 521; *Inga,* A. Rich. Fl. Abyss. i. 235, in part.)

Upper Guinea. Senegambia. *Heudelot!*
Nile Land. Abyssinia, *Schimper!*

16. **A. brachycalyx,** *Oliv.* Tree of 20–30 ft., extremities petioles and peduncles thinly pubescent. Leaves as in *A. fastigiata,* though smaller; rachis often with glands between the upper 2 or 3 pinnæ; leaflets glabrous, broadly obliquely pointed or obtuse, mucronulate, 3–5 lines long, $1\frac{1}{2}$–$2\frac{1}{2}$ lines broad. Peduncles slender, $\frac{1}{2}$–$1\frac{1}{2}$ in. long, fascicled in the upper axils; pedicels 1 line. Flowers glabrous. Calyx minute, campanulate, truncate, denticulate, $\frac{1}{2}$ line long. Petals united $\frac{2}{3}$–$\frac{3}{4}$, 6–8 times longer than calyx. Staminal tube 4 times longer than petals. Ovary subsessile. Legume not seen.

Nile Land. Uzinza, near Lake Victoria Nyanza (205), *Speke and Grant!*

17. **A. fastigiata,** *E. Mey. Comm.* 165. Tree; extremities petioles and peduncles rusty-pubescent. Leaf-rachis 3–6 in. long, with a sessile gland near the base and usually between the uppermost pinnæ; pinnæ 4–7-jugate; leaflets 8–15-jugate, oblong-trapezoidal, sessile, subquadrate at base, obtuse, with a diagonal midrib, the uppermost pair usually smaller than below, glabrous and often shining and reticulate above, pubescent beneath; $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{4}$ in. broad more or less. Stipules deciduous, often on the flowering extremities 3–5 lines long, obliquely ovate, pubescent. Peduncles 1–2 in. long, axillary or fascicled from leafless sometimes stipulate nodes, usually more or less corymbose at the extremities or on short lateral branches. Flowers pubescent or sericeous, subsessile or shortly pedicellate. Calyx narrowly infundibuliform, dentate, $1\frac{1}{2}$–2 lines long. Petals united $\frac{3}{4}$–$\frac{4}{5}$, twice as long as calyx. Staminal sheath much exserted. Legume straight 4–6 in. long, 1–$1\frac{1}{4}$ in. broad; valves rather thickly coriaceous, coarsely subprominently reticulate.—*Zygia fastigiata,* E. Mey.; Benth. in Hook. Journ. Bot. 1844, 93. *Mimosa adianthifolia,* Schum. et Thonn. Pl. Guin. 322 (*fide* Benth. in Hb. Kew.)

Upper Guinea. Near Sierra Leone, *Afzelius! Dr. Kirk!* Senegambia, *Heudelot!* Bagroo river, *Mann!* Dahomey, *Consul Burton!*

Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*
A native sauce is prepared from the seeds by maceration.
Grows also at Natal.
The *Sassa* figured by Bruce, Travels vii. 4 and 5 (*Inga Sassa*, Willd. Sp. Pl. iv. 1027) may be this species or perhaps *A. brachycalyx*. I have not seen either from Abyssinia. Dr. Schweinfurth (Reliq. Kotschyanæ, p. 10) identifies the *Sassa* with *Z. fastigiata*, E. Mey.

18. **A. Petersiana,** *Bolle in Peters' Mossamb. Bot.* i., t. 1. Shrub, wholly glabrous or young extremities obsoletely puberulous. Leaf-rachis $\frac{1}{2}$–2 in. long, with a sessile gland near the base; pinnæ 2–4-jugate; leaflets 3–6-jugate, subsessile, obovate-rhomboidal, obtuse, glabrous, $\frac{1}{3}$- to little over $\frac{1}{2}$ in. in length; the upper sometimes nearly 1 in. long and over $\frac{1}{2}$ in. broad (*Bolle*). Peduncles 1–1$\frac{1}{2}$ in. long, slender, fascicled from leafless nodes, forming short corymbs. Flowers "purple," glabrous. Calyx tubular-campanulate, dentate, about 1 line long. Petals united $\frac{3}{4}$–$\frac{4}{5}$, 5 times longer than the calyx, forming a tubular corolla dilated at the throat. Staminal tube slender, far exserted. Legume not seen.

Mozamb. Distr. Zambesi, *Dr. Peters*. Rovuma river, 28 miles from the coast, *Dr. Meller!*

19. **A. Brownei,** *Walp. Rep.* i. 928. Tree of 30 ft. or more; extremities terete, minutely or obsoletely puberulous at first. Leaf-rachis 3–6 in. long, puberulous or glabrate, with a conspicuous sessile gland near the base and between the uppermost pinnæ; pinnæ usually 2–3-jugate; leaflets 3–5-jugate, obliquely rhomboid-elliptical, or varying more or less ovate or obovate, broadly and obtusely pointed, glabrous, shining, reticulate, subsessile, the upper usually considerably larger, 1$\frac{1}{2}$–3 in. long, lowest $\frac{1}{2}$–1 in. Peduncles puberulous, 1–1$\frac{1}{2}$ in. fascicled in the leafless nodes of the extremities, forming broad corymbose racemes 3–4 in. long, or the lower peduncles from the axils of the ordinary leaves, which usually overtop the inflorescence. Pedicels 0, or shorter than the tubular denticulate calyx, which is 1–1$\frac{1}{2}$ lines long. Petals united $\frac{2}{3}$, nearly 3 times as long as calyx. Staminal tube about 3 times as long as the flower. Legume flat, linear-oblong, 4–6 in. long, 1 in. broad more or less, valves with transverse subdistant but slightly prominent nervures.—*Inga Zygia*, DC. Mém. Leg. 440, t. 65; Benth. in Hook. Journ. Bot. 1844, 92; Guill. et Perr. Fl. Seneg. i. 236.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot! Leprieur and Perrottet.* Abbeokuta, *Dr. Irving!* Calabar river, *Mann!*
Lower Guinea. Golungo Alto, Angola (leafy specimens and early buds, probably of this species), *Dr. Welwitsch!*
De Candolle cites the Antilles for this plant through mistake.
In the Afzelian herbarium is a specimen with the label "Hesley brought me this plant, Jan. 14, 1795, together with a very fine gum like Copal which he had taken on it."

20. **A. Welwitschii,** *Oliv.* Tree of 40–50, occasionally 80 ft., with a spreading truncate crown (*Dr. Welwitsch*); extremities glabrous or with

the petioles and peduncles tawny-puberulous. Leaf-rachis 3–6 (–10) in. long, with a conspicuous gland near the base, and usually 1 or more above; pinnæ 3–4- (–5) jugate; leaflets 4–8-jugate, obliquely ovate- or oblong-rhomboidal obtuse or broadly pointed, base truncate parallel with the rachis, midrib diagonal, glabrous, shining and reticulate above; usually $\frac{3}{4}$–$1\frac{1}{4}$ in. long, the uppermost pair either longer or shorter than those next below, varying to 2 in. in length. Peduncles 1–2 in. from the upper axils or forming short leafless terminal corymbs, sometimes or scarcely overtopped by the leaves; pedicels very short or 0. Calyx tubular, 5-dentate, $\frac{1}{2}$–$\frac{1}{3}$ as long as the corolla. Petals united $\frac{3}{4}$, like the calyx silky-puberulous. Staminal tube slender, 4–5 times as long as the flower. Legume straight or slightly curved, obtuse, 4–5 in. long, $\frac{3}{4}$–$\frac{5}{6}$ in. broad; valves thin, subcoriaceous.

Upper Guinea. Gaboon river, *Mann!* (Extremities tawny-puberulous. • Exserted staminal-tube exceeding 1 in.)

Lower Guinea. Golungo Alto, *Dr. Welwitsch!* (Extremities glabrous. Exserted staminal-tube 1 in. or less.)

! **Nile Land.** Fesoghlu, *Cienkowski.* (Figured as *Zygia Brownei*, Walp., in Schweinf. Reliq. Kotschyanæ, Tab. x.)

A. Mozambicensis, Bolle in Peters' Mossamb. Bot. 4.

Tree; extremities obscurely 4-angular, with the petioles pubescent; irregularly scattered with small solitary slightly recurved blackish prickles. Pinnæ 6–11-jugate, leaflets small linear-oblong oblique, thinly ciliate multijugate. Flowers . . . . Legume 3 in. long, $\frac{1}{2}$ in. broad, 2-valved; valves coriaceous, margins thickened. Seeds 10, oblong-ovate, 3–4 lines long.

Mozamb. Distr. Zambesi, *Dr. Peters.*

This plant I do not know, and doubt if it belong to the genus. Perhaps an *Acacia.*

Speke and Grant collected in Usagara, on their way from Zanzibar to the head waters of the Nile, a leaf of a tree apparently allied to *Zygia* or *Pithecolobium* (the *Zygia* No. 4 of their Appendix), the M'Koondée of the natives. It is a tree of large size. Leaves agreeing well with those of *Zygia*, but the inflorescence is figured by Col. Grant as pendulous and capitate, like that of a *Parkia*. The legumes are very long. "The natives cover their poisoned arrows with strips from the long pod when they do not use leather." I cannot identify the plant.

17. PITHECOLOBIUM, Mart.; Benth. et Hook. f. Gen. Plant. i. 596.

Flowers capitate (in African species), usually 5-merous. Calyx tubular or campanulate, denticulate. Petals united beyond the middle. Stamens indefinite, exserted; filaments united at the base; anthers small, pollen said to be as in *Albizzia.* Legume (in following species) compressed, coriaceous, circinate, constricted between the seeds, "indehiscent or separating in 1-seeded articles."—Trees or shrubs, unarmed or with stipular or axillary spines. Leaves bipinnate, leaflets various. Inflorescence capitate (or spicate), axillary (or corymbose, racemose or panicled at the extremities).

A large genus, principally Tropical American and Asiatic. The only satisfactorily determined Tropical African species belongs to Mr. Bentham's Section V. *Cathormion* (Hook. Journ. Bot. 1844, 197).

1. **P. altissimum.** Tall tree; extremities, leaf-rachis and peduncles rusty-puberulous, branches at length glabrate. Leaves 4–8 in. long; pinnæ 4–7-jugate, leaflets linear-oblong, glabrous, $\frac{1}{3}$–$\frac{1}{2}$ in. long, 1 line, more or less, broad, 20–25-jugate. Flowers capitate, sessile; peduncles $\frac{3}{4}$ in. more or less, axillary, solitary or fascicled or shortly racemose on lateral branchlets. Calyx tubular, shortly dentate, nearly glabrous. Petals united nearly throughout, 2–$2\frac{1}{2}$ times longer than calyx. United base of the filaments included. Peduncles in fruit often stout. Legume compressed, spirally contorted, more or less constricted between the seeds at intervals of $\frac{1}{3}$–$\frac{1}{2}$ in., 8–10 in. long, $\frac{1}{3}$–$\frac{2}{3}$ in. broad.—*Albizzia altissima*, Hook. f. Fl. Nigr. 332.

Upper Guinea. Niger Expedition, *Dr. T. Vogel!* Aboh, Niger, *Barter!* Nun and Camaroons river, *Mann!*

Order XLVIII. ROSACEÆ. (By Prof. Oliver.)

Flowers regular, rarely irregular, hermaphrodite (polygamous or dioicous in *Pygeum*, *Brayera*, *Cliffortia*). Calyx free (or apparent tube adherent to the ovary), tube various, short or elongate, plane campanulate or urceolate, lobes usually 5 imbricate or biseriate or with alternating bracteoles. Stamens perigynous, indefinite (or definite in *Alchemilla*, some *Cliffortiæ* and *Neurada*); filaments free or more or less coherent in *Chrysobalaneæ*. Carpels 1 or more, definite or indefinite, free or consolidated with the calyx-tube or receptacle; styles as many as carpels, oblique and subterminal or ventral. Ovules 1 or 2 in Trop. African Genera. Fruit various, if superior the carpels dry or drupaceous, if inferior baccate. Seed erect or pendulous, almost invariably exalbuminous.—Herbs, shrubs or trees. Leaves various, simple or compound, usually alternate and stipulate. Inflorescence very various.

A rather large and wide-spread Natural Order, most numerous in temperate regions of the Northern hemisphere. *Brayera* and *Griffonia* are the only genera peculiar to tropical Africa, but perhaps the latter is not generically distinct from *Acioa*, Aubl., of tropical America, though maintained at present, following the "Gen. Plantarum" of Bentham and Hooker. *Cliffortia* is exclusively African, but restricted to the Cape, with but the exception of one species.

Shrubs, sometimes scandent, or trees. Leaves simple, entire. Carpel solitary, free; ovules 2, erect; style basal (§ *Chrysobalaneæ*).

Ovary sessile at base of calyx-tube; 1-celled.	1. Chrysobalanus.
Ovary sessile in mouth of calyx-tube.	
Ovary wholly or partially 2-celled. Filaments connate only at base	2. Parinarium.
Ovary 1-celled. Filaments united in long strap.	3. Griffonia.

Trees or shrubs. Leaves simple, entire or serrate. Carpel usually solitary, style subterminal; ovary superior, with 2 pendulous ovules (§ *Pruneæ*).

Petals small. Pericarp dry, coriaceous	4. Pygeum.
Petals conspicuous. Fruit a drupe (*cultivated* only)	*Prunus.
Shrubs, usually aculeate (in Africa). Calyx persistent, inferior; lobes ebracteolate. Stamens ∞. Carpels ∞, inserted on convex receptacle. Ovules 2, pendulous (§ *Rubeæ*) . . .	5. Rubus.

Herbs (in Trop. Africa). Leaves digitate or pinnate. Calyx-lobes bracteolate. Stamens indefinite. Carpels ∞, inserted on a convex receptacle, dry (§ *Potentilleæ*) . . . . . 6. POTENTILLA.

Herbs or trees. Leaves various. Calyx-tube funnel-shaped, more or less narrowed at the throat over the free ovary. Stamens definite or indefinite. Carpels 1–5. Achene enclosed in calyx-tube (§ *Poterieæ*).

Herbs. Flowers minute, hermaphrodite. Calyx-lobes 2-seriate. Petals 0. Stamens usually 4 . . . . . 7. ALCHEMILLA.
Shrubby. Flowers minute, polygamous or dioicous. Petals 0. Calyx-lobes 1-seriate . . . . . 8. CLIFFORTIA.
Tree. Leaves pinnate. Flowers panicled, polygamous or dioicous. Calyx-lobes 2-seriate. Petals 0 or 5. Stamens ∞ . 9. BRAYERA.
Shrubs. Leaves pinnate. Petals conspicuous, 5. Carpels ∞, free, enclosed in the receptacle or calyx-tube which is constricted at the mouth (§ *Roseæ*) . . . . . 10. ROSA.
Herbs. Leaves simple, lobed or cut. Carpels 5–10, more or less consolidated with the calyx-tube. Petals minute. Calyx-lobes bracteolate . . . . . 11. NEURADA.

1. CHRYSOBALANUS, Linn.; Benth. et Hook. f. Gen. Plant. i. 606.

Calyx-tube turbinate, limb of 5 nearly equal imbricate segments. Petals 5, early deciduous; inserted in the mouth of the tube. Stamens 15 or more, uniseriate, perigynous, all antheriferous or some anantherous; filaments (free or) united more or less at the base; anthers ovoid or roundish, 2-celled, dehiscing longitudinally. Ovary sessile at the base of the calyx-tube, hirsute or glabrous, 1-celled with 2 erect ovules; style basal. Fruit drupaceous; endocarp coriaceous or crustaceous, "indehiscent or 5–6-valved, adhering firmly to the mesocarp;" seed solitary.—Small trees or shrubs. Leaves alternate, simple, entire, glabrous. Stipules very small, caducous. Inflorescence in axillary and terminal paniculate or racemose silky or hoary-pubescent cymes; flowers $\frac{1}{4}$–$\frac{1}{3}$ in. diameter, white.

A small genus, confined to Tropical Africa, and the warmer parts of the New World.

Leaves broadly bounded or retuse at apex . . . . . 1. *C. Icaco.*
Leaves obtusely apiculate or broadly pointed . . . . . 2. *C. ellipticus.*

1. **C. Icaco,** *Linn.; DC. Prod.* ii. 525. A low diffuse shrub of 1–3 ft. or varying to a small tree of 8 or 10 ft., almost wholly glabrous excepting the hoary-tomentose flowers and peduncles. Leaves rather coriaceous, broadly elliptical or rotundate, rounded and entire at the apex to obovate-rotundate emarginate and obcordate, usually from $1\frac{1}{2}$–$3\frac{1}{2}$ in. long, $1\frac{1}{4}$–$2\frac{1}{2}$ in. broad; petiole distinct, 1–2 lines. Paniculate cymes terminal and occasionally prolonged beyond the leaves or axillary and usually falling short of or hardly exceeding them. Fruit the size of a plum, yellow, red, purple or whitish.—*C. pellocarpus,* Mey. Prim. Fl. Esseq. 193 (distinguished as var. β. *pellocarpa* by Dr. Hooker in Mart. Fl. Bras. Chrysobal. 7), *C. orbicularis,* Schum. et Thonn. Pl. Guin. 232; *C. luteus,* Sabine, DC. Prod. ii. 526?

Upper Guinea. Numerous localities from Senegambia southwards, apparently affecting maritime or swampy situations.

Lower Guinea. Loanda and Ambriz, Angola, *Dr. Welwitsch!*

Also in Tropical America. The "Cocoa Plum" of the West Indies.

2. **C. ellipticus,** *Solander; DC. Prod.* ii. 526. Very closely allied to the foregoing; varying from a low shrub to a tree of 30 ft. in height (*Mann*). Leaves elliptical, broadly and obtusely pointed or obtusely apiculate or simply obtuse, not broadly rounded or retuse as in *C. Icaco*, in the narrower-leaved forms cuneately narrowed into the petiole; 2–3 in. long, 1–1¾ in. broad; petiole 1–2 lines. Inflorescence shorter than leaves in our specimens. Fruit the "size of a damson plum, with a thick black skin" (*Don*).—*C. Icaco*, *L.* var. *elliptica*, Hook. f. in. Mart. Fl. Bras. Chrysobal. 7.

Upper Guinea. Senegambia! Sierra Leone, *Don!* Ibu and Grand Bassa, *T. Vogel!* Lagos, *Barter!* Nun river, *Mann!*

Lower Guinea. Congo, *Dr. Smith!*

Probably common in Upper Guinea. What appears to be the same species (*C. guianensis*, Klotzsch), occurs in Tropical America, whether introduced only I cannot say.

2. PARINARIUM, Juss.; Benth. et Hook. f. Gen. Plant. i. 607.

Calyx-tube short or elongate, uniformly narrowed below or more or less gibbous, hollow or solid nearly throughout, lobes 5, obtuse and imbricate or acute and sometimes subvalvate. Petals 5 (or 4), inserted in mouth of calyx-tube, caducous. Stamens 7–∞, perigynous; filaments shortly united at base, when the stamens are unilateral with a toothed or entire margin around the calyx-tube continuous with the sheath; anthers ovoid or rotundate. Ovary inserted in the mouth of the calyx-tube, hirsute, wholly or partially 2-locellate, with 1 ovule in each cell; style basal. (Carpels occasionally 2.) Drupe ellipsoidal or subglobose, with a bony 1–2-locular putamen.—Trees or shrubs. Leaves alternate, coriaceous, entire, base of lamina or petiole frequently 2-glandular. Stipules linear or subulate, deciduous. Flowers cymose, 2-bracteolate, in axillary or terminal pyramidal or corymbose panicles, rarely racemose.

A considerable genus, widely diffused in the warmer regions of both hemispheres. All of the following species, excepting one, are peculiar to Africa.

A. Calyx-tube campanulate or turbinate, hollow, not or scarcely gibbous, teeth acute. Antheriferous stamens usually 7–10, not exceeding the calyx. Buds enclosed between a pair of caducous bracteoles (§ *Petrocarya*).

Leaves elliptical acuminate, base entire, rounded or broadly cuneate	1. *P. excelsum.*
Leaves ovate-oblong, broadly pointed, base cordate; petiole ⅙ in.	2. *P. subcordatum.*
Leaves elliptic-oblong, rounded and obtuse at each end; petiole ¼–⅓ in. Panicle lax	3. *P. curatellæfolium.*
Leaves elliptic-oblong, obtuse, base entire or subcordate; petiole ⅙–⅓ in. Panicle dense. Tree or shrub	4. *P. Mobola.*
Leaves linear-oval to elliptic-oblong, obtuse, ⅓–1 in. broad; petiole 1/12–¼ in. Shrub ⅙–1½ ft.	5. *P. capense.*

B. Calyx-tube hollow, distinctly gibbous, teeth obtuse. Stamens 10–20, exserted (§ *Neocarya*).
Flowers in terminal raceme. Leaves ovate-elliptical, 3–8 in. 6. *P. macrophyllum.*

C. Calyx-tube pyriform or clavate, not gibbous, solid below, teeth obtuse. Stamens indefinite, exserted (§ *Sarcostegia*).

Leaves broadly elliptical, apiculate, tomentose beneath . . 7. *P. chrysophyllum.*
Leaves elliptic-oblong, obtuse or apiculate, with scattered hairs beneath. Inflorescence dense, tomentose . . . . 8. *P. polyandrum.*
Leaves elliptic-oblong, acuminate, minutely appressed-tomentose beneath. Inflorescence tomentose. Calyx-tube and pedicel $\frac{1}{3}$ in. . . . . 9. *P. robustum.*
Leaves elliptic-oblong, acuminate, glabrous. Inflorescence glabrous. Calyx-tube and pedicel $\frac{1}{2}$ in. . . . . 10. *P. glabrum.*

1. **P. excelsum,** *Sabine; DC. Prod.* ii. 527. Large tree; leafy extremities appressed tawny-tomentose. Leaves coriaceous, elliptic-oblong or elliptical, shortly and usually rather abruptly acuminate, rounded or broadly cuneate and entire at base, glabrescent, dark green or the midrib puberulous, dull and occasionally obscurely reticulate when dry above, closely hoary-tomentose beneath, nervures 18–25 on each side, rather prominent; 2–4 in. long, $1\frac{1}{6}$–2 in. broad, petiole $\frac{1}{4}$–$\frac{1}{2}$ in., channelled, with a pair of glands near the middle. Flowers in axillary tawny-tomentose divaricately branched panicles, shorter than the leaves, or panicles confluent towards the extremities forming an ample pyramidal or corymbose inflorescence. Bracts ovate, acuminate, sheathing the buds to near expansion, caducous. Pedicels equalling or much shorter than the hollow campanulate calyx-tube. Calyx-teeth valvate, lanceolate, acute, equalling or exceeding the tube. Petals caducous, linear-lanceolate to ovate-lanceolate, apparently dissimilar in the same flower. Antheriferous stamens about 8, not exceeding the calyx.—Guill. et Perr. Fl. Seneg. i. 274, t. 62; *P. brachystachyum*, Benth. in Hook. Journ. Bot. 1840, 213.

Upper Guinea. Sierra Leone, *Morson!* Senegambia! St. Thomas, *Don!* Bagroo river, *Mann!*

The "Gray" or "Rough-skinned Plum" of Sierra Leone. "The pulp is dry, farinaceous, and, owing to the size of the stone, small in quantity, with an insipid taste."

Also in Guinea and Northern Brazil, if I be correct in identifying *P. brachystachyum* with it.

2. **P. subcordatum,** *Oliv.* Tree attaining 40–50 ft.; extremities tawny pubescent-tomentose, at length glabrate, frequently lenticellate. Leaves coriaceous, ovate- elliptic- or broadly lanceolate-oblong, broadly pointed or obtuse, base rounded and narrowly but distinctly cordate, upper surface at first thinly tomentose, at length glabrate, rather obscurely reticulate, tomentose beneath or in older leaves with the thick raised veinlets glabrescent, lateral nerves 15–20; usually from 2–$3\frac{1}{2}$ in. long, $\frac{3}{4}$–$1\frac{3}{4}$ in. broad; petiole $\frac{1}{6}$ in. with a pair of glabrous glands near the middle. Flowers cymose in axillary silky-tomentose panicles shorter than or equalling the leaves, towards the extremities confluent forming a leafy inflorescence. Bracts ovate-lanceolate acuminate, glabrous within, caducous. Calyx-tube hollow, funnel-shaped; lobes ovate-

lanceolate, acute. Petals elliptical or oblanceolate, nearly equalling the calyx. Antheriferous stamens about 7. Drupe (dry) oblong, 2-celled, 2-seeded, with a thick bony endocarp.

Upper Guinea. Nupe, Niger, *Barter!*
Lower Guinea. Congo, *Smith!*

3. **P. curatellæfolium,** *Planch. Fl. Nigrit.* 333. A small or medium-sized tree; extremities tawny-tomentose, branches terete lenticellate. Leaves elliptic-oblong, obtuse at each end; upper surface with a deciduous tomentum on expansion, at length glabrescent, more or less scabrid, tomentose and reticulate beneath, lateral nerves 14–20; $2\frac{1}{2}$–$4\frac{1}{2}$ in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in. broad; petiole $\frac{1}{4}$–$\frac{1}{3}$ in., eglandular or glands minute near the middle. Panicles tomentose, terminal or from the upper axils and confluent, 3–6 in. long, branches spreading. Bracts as in allied species, ovate-lanceolate acute, caducous. Calyx-tube campanulate, hollow; teeth ovate or ovate-lanceolate, acute. Petals oblong or oblanceolate, nearly equalling the calyx. Antheriferous stamens about 7, scarcely so long. Drupe "about the size of an ordinary plum, of a mealy taste, not unpleasant." Endocarp thick and bony.

Upper Guinea. Senegambia, *Heudelot!* On the Quorra, *T. Vogel!* Nupe, Niger, *Barter!*
Mozamb. Distr. Zanzibar, *Dr. Kirk!*
One of the best native fruits, according to Mr. Barter.

4. **P. Mobola,** *Oliv.* Tree of considerable size or dwarfed on the sea-coast; leafy extremities rusty-tomentose. Leaves coriaceous, oblong or elliptic-oblong, very obtuse, rounded and obscurely or more distinctly narrowly cordate or subentire at base, glabrescent and usually subscabrid or rugulose above, closely hoary-tomentose beneath, lateral nerves 17–25, $2\frac{1}{2}$–$5\frac{1}{2}$ in. long, $1\frac{1}{3}$–$2\frac{1}{3}$ in. broad. Petiole stout, $\frac{1}{6}$–$\frac{1}{3}$ in. with or without glands near the middle. Panicles terminal and from the upper axils, the cymes rather compact, silky-tomentose, in fruit lax or divaricate. Bracts as in allied species. Calyx-tube turbinate or campanulate, lobes triangular or ovate-lanceolate acute. Petals oblanceolate or oblong, shorter than calyx. Antheriferous stamens 7–8, scarcely so long as calyx, filaments slender, anthers ovoid, submucronate. Drupe subglobose or plum-like, with a thick bony 2- or 1-celled putamen; pulp strawberry-like in flavour (Dr. Kirk).

Lower Guinea. Pungo Andongo and Huilla, Angola, *Dr. Welwitsch!*
South Central. Batoka Highlands, *Dr. Kirk!*
Mozamb. Distr. Zambesi land, *Dr. Kirk!*
The Mola or Mobola (Sechuana) plum of Dr. Kirk's notes. Nearly allied to *P. obtusifolium*, Hook. f., of Brazil.

5. **P. capense,** *Harv. Fl. Cap.* ii. 597. A low shrub 2 or 3 in. to a foot or 18 in. in height, throwing up leafy tomentose cæspitose shoots from a stout woody stock. Leaves from narrowly oval-oblong many times as long as broad to oblong-elliptical twice as long as broad, apex obtuse, narrowed to the base in the stenophyllous forms, coriaceous, glabrate above, tomentose and reticulate beneath, lateral nerves 15–25,

2–4 in. long, ½–1 in. broad, or 2 in. broad in var. *latifolia*. Petiole stout, 1 line (or 2 lines in var.), glands near the middle or 0. Stipules linear, ¼–½ in., caducous. Cymes in small terminal or subterminal tomentose panicles. Calyx-tube hollow, lobes ovate-lanceolate, acute. Petals narrowly obovate, scarcely equalling the calyx. Fertile stamens about 8. Ripe fruit not seen.

Lower Guinea. Huilla (typical narrow-leaved form), and Cazengo, Angola (var. *latifolia*, leaves 2–3 times as long as broad, rounded at base), *Dr. Welwitsch!*

South Central. Sesheke (the Cape form described by Dr. Harvey), *Dr. Kirk!*

6. **P. macrophyllum,** *Sabine in Trans. Hort. Soc.* v. 452. Shrub or small tree; extremities rusty pilose-tomentose. Leaves ovate-elliptical, very obtuse or obtusely pointed, base usually broadly shallow-cordate, glabrous or glabrescent above excepting the tomentose midrib, shortly tomentose beneath, the prominent midrib nervures and reticulation darker and relieved upon the pale or whitish tomentum of the interstices, lateral nervures 15–22 on each side; 3–8 in. long, 2–5 in. broad, more or less; subsessile, or eglandular petiole not exceeding 1 line. Flowers in simple terminal tomentose racemes. Pedicels equalling or shorter than the unilateral broadly gibbous hollow calyx-tube. Calyx-lobes unequal, ovate-oblong and oblong, obtuse, glabrous within. "Petals oval, scarcely exceeding the calyx." Stamens unilateral, antheriferous, 10–20, exserted; filaments more or less connate at base. Throat of calyx densely hirsute with inflexed hairs. Ovary hirsute, 2-locellate. Fruit ovoid, size of a goose's egg, glabrous, yellowish; sarcocarp thick, fleshy, putamen bony, very thick, anfractuose. —*P. senegalense*, Perr., DC. Prod. ii. 527; Guill. et Perr. Fl. Seneg. i. 273, t. 61.

Upper Guinea. Senegambia, *Brunner! Sieber! Perrottet!* St. Thomas, *G. Don!*

The "Ginger-bread Plum" of Sabine's report on the edible fruits of Sierra Leone.

7. **P. chrysophyllum,** *Oliv.* Tree; extremities rather stout, terete, at first thinly pilose-pubescent, at length glabrous. Leaves coriaceous, broadly elliptical or ovate-elliptical, obtuse, very shortly apiculate, base rounded, entire, glabrous and shining above, covered beneath with a thin but close reddish or cinnamon-coloured easily detached tomentum, midrib and lateral nerves (8–9 on each side) prominent beneath; 5–7½ in. long, 3–4 in. broad; petiole with a pair of small sessile glands at the base of lamina, ¼–½ in. long. Inflorescence a tawny-tomentose compact somewhat unilateral cymose terminal panicle, 4–5 in. in breadth, but little or scarcely overtopping the leaves. Bracteoles caducous sometime before expansion. Calyx-tube solid nearly throughout, gradually narrowed below, ½ in. from the base of lobes to first bracteoles; lobes coriaceous, ovate-rotundate, ½ as long as tube. Petals elliptical, subacute, rather exceeding the calyx. Stamens indefinite, unilateral, exserted, ¾–1 in. long, filaments very shortly united at base the confluent portion (or disk) continued round the calyx-tube. Ovary densely hirsute, 2-locellate.

Upper Guinea. Gaboon river, *Mann!*

8. **P. polyandrum,** *Benth. in Fl. Nigrit.* 333. Shrub or small tree attaining 12–20 ft.; extremities thinly pilose-pubescent or glabrate. Leaves coriaceous, elliptic-oblong obtuse entire or very shortly apiculate, rounded or broadly cuneate at base, glabrous shining smooth or obsoletely scabrid above, glabrous or with few scattered hairs beneath, lateral nervures scarcely prominent, 5–8 on each side; $3\frac{1}{2}$–$4\frac{1}{2}$ in. long, $1\frac{3}{4}$–2 in. broad; petiole with a pair of sessile glands at base of lamina, $\frac{1}{6}$ in. Flowers white, in dense many-flowered cymosely-branched more or less hoary-tomentose terminal panicles 3–6 in. broad. Ultimate bracteoles caducous, ovate-rotundate, $\frac{1}{9}$–$\frac{1}{6}$ in. long. Calyx-tube pyriform, nearly solid, about $\frac{1}{4}$ in. to first bracteoles; segments ovate-rotundate, obtuse, coriaceous. Petals broadly rounded above, little exceeding the calyx. Stamens indefinite (35–40) unilateral, very shortly connate at base; filaments 2–3 times as long as calyx, but much twisted and little exserted. Carpels frequently 2 or more; ovary hirsute, bilocellate. Fruit ellipsoidal, "resembling a young peach," with a thick woody putamen and thin sarcocarp. In our specimens $\frac{3}{4}$–1 in. long, thinly tomentose.

Upper Guinea. Attah on the Quorra, *T. Vogel!* Nupe, *Barter!*

Mr. Barter says the fruit is hardly edible, and that the wood is well-suited for the charcoal used by native smiths.

9. **P. robustum,** *Oliv.* Tree of 40 ft.; extremities stout, terete, with small scattered lenticels, glabrate. Leaves coriaceous, oblanceolate- or elliptic-oblong, with an obtuse acumen of $\frac{1}{4}$–$\frac{1}{2}$ in., base cuneate, glabrous above, paler beneath, with a minute cinnamon-coloured puberulous tomentum upon which the prominent midrib is relieved in darker colour, lateral nervures distant, 5–7 on each side; 4–5 in. long, $1\frac{1}{6}$–$1\frac{3}{4}$ in. broad. Petiole with a pair of sessile glands at the base of the lamina, $\frac{1}{4}$ in. long more or less. Flowers "yellow" in broad terminal cymosely branched pilose-pubescent panicles, 4–6 in. broad. Bracteoles caducous. Calyx-tube and pedicel about $\frac{1}{3}$ in. to first bracteoles; tube solid, segments broadly ovate-rotundate. Stamens indefinite, the annulus at base incomplete. Carpels 1 or 3. Ovary densely hirsute, 2-locellate.

Upper Guinea. Banks of Nun river, *Mann!*

Allied to *P. Griffithianum,* Benth. A species of the Malayan region and North Australia.

10. **P. glabrum,** *Oliv.* Tree of 30 ft., wholly glabrous or inner sepals only thinly pulverulent-tomentose. Leaves coriaceous elliptical or oblong-elliptical, narrowed to each end, with a narrow obtuse acumen, base cuneate with a pair of minute or obsolete glands at the insertion of the petiole, midrib prominent beneath, lateral nervures and reticulation scarcely prominent; 3–4 in. long, 1–$1\frac{3}{4}$ in. broad; petiole $\frac{1}{4}$–$\frac{1}{3}$ in.; glands at base of lamina obscure or 0. Flowers very numerous in terminal much cymosely-branched panicles. Bracts caducous. Calyx-tube solid, clavate, gradually narrowed below, about $\frac{1}{2}$ in. with the pedicel to the first articulation. Calyx-lobes rotundate, coriaceous.

Stamens indefinite, unilateral, sub-biseriate, the short annulus continuous all round; filaments much exceeding the calyx, 20 or more, filiform crumpled. Ovary hirsute, 2-locellate.

Upper Guinea. River Muni, *Mann!*

3. **GRIFFONIA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 608.

Calyx-tube cylindrical or narrowly infundibuliform, lobes 5 equal or nearly so, inner surface and covered margins hoary- or silky-tomentose. Petals caducous, elliptical or oblong, veined. Stamens indefinite, unilateral; filaments united in a long narrow strap, circinate in bud, free at the apex; anthers small, elliptical or roundish. Ovary inserted in the mouth of calyx, hirsute, 1-locular, 2-ovulate; style basal, long, slender. Fruit a nut or drupaceous, 1-seeded; pericarp crustaceous (in *G. Barteri*).—Small trees or climbing shrubs. Leaves alternate, simple, entire, glabrous above. Stipules linear to ovate. Flowers in simple or panicled axillary or terminal racemes, bracteate and bracteolate.

Confined to West Tropical Africa.

M. Baillon may be right in reducing this genus to *Acioa*, Aubl., as distinguished from *Couepia*, Aubl. (Adansonia, vii. 222), but I have not the necessary material for comparison, and the fruit of *Acioa*, as figured by Aublet, does not agree with that of *G. Barteri*, the only *Griffonia* of which I have seen a fruit. I adopt *Griffonia*, Hook. f., as I find M. Baillon mistaken in his note upon the priority of his genus of the same name (Adansonia, l. c.).

Flowers in simple racemes.
- Bracteoles palmatifid.
  - Leaves 8 in. by 4–5, auricled at base . . . . . 1. *G. Icondere.*
  - Leaves 4–6 in. by 1½–3½, entire at base . . . . . 2. *G. Bellayana.*
- Bracteoles lanceolate or ovate, entire . . . . . 3. *G. pallescens.*

Flowers in compound or panicled racemes.
- Leaves 5–7 in., lateral nerves 6–10. Stipules ovate . . . . 4. *G. Mannii.*
- Leaves 2½–5 in., lateral nerves 4–6. Stipules narrow-linear . . 5. *G. Barteri.*

1. **G. Icondere.** Climbing shrub; extremities thick as a goose-quill, clothed with dense tomentum. Leaves subsessile, elliptic-ovate, obtuse or apiculate, base equally or unequally auricled, thickly coriaceous, glabrous above, shortly tomentose and paler beneath, reticulation rather prominent beneath, 8 in. long, 4–5 in. broad. Stipules oblong-lanceolate attenuate, ⅓–½ in. Flowers in simple nutant racemes from the upper axils, 4 in. long. Bracts ovate acuminate, ⅙ in. Pedicels slender, glabrous, ⅓–¾ in. Calyx-tube exceeding the pedicel, tubular-infundibuliform, obliquely dilated a little above the narrowed base.—*Acioa (Lorandra) Icondere*, Baill. in Adansonia, vii. 233 (note).

Upper Guinea. Gaboon river, *Griffon du Bellay.*
Description from M. Baillon. I do not know the plant.

2. **G. Bellayana.** Tree of 15–25 ft. (*Dr. Welwitsch*); extremities terete, nearly the thickness of a goose-quill, densely rusty tomentose-pubescent. Leaves broadly elliptic-oblong varying to obovate-oblong, obtuse or apiculate, base rounded, entire, coriaceous or membranous,

glabrous, reticulate above, minutely softly hairy beneath, 4–6 in. long, $1\frac{3}{4}$–$3\frac{1}{2}$ in. broad; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. Stipules linear or ovate-lanceolate, equalling the petiole. Flowers in axillary and subterminal roundish or pyramidal dense glabrous or thinly hairy simple racemes, $1\frac{1}{2}$–2 in. long. Bracts lanceolate, 2–3 lines long, silky or glabrous. Pedicels slender, glabrous, $\frac{1}{4}$ in. long; bracteoles glandular-palmatifid, 1 line long more or less. Calyx-tube slender, glabrous, 1 in. or less, faintly thickened above the base; lobes elliptical. Petals caducous, elliptical obtuse. Staminal sheath 1–$1\frac{1}{2}$ in., the base continued as a raised margin round the faux. Fruit not seen; very young ovoid-oblong, clothed with dense short ferruginous tomentum and long thin hairs.—*Acioa* (*Lorandra*) *Bellayana*, Baill. in Adansonia, vii. 224 (note).

Upper Guinea. Gaboon river, *Griffon du Bellay.*
Lower Guinea. Golungo Alto, Angola, *Dr. Welwitsch!*

The name is odd, but I have no alternative, and I cannot doubt that M. Griffon du Bellay is worthy of his *double* honour.

Dr. Welwitsch's specimens differ in some slight particulars from M. Baillon's full description, but I find no excuse for maintaining two species. This plant is the *Dactyladenia floribunda* of Dr. Welwitsch's Apont. 572.

3. **G. pallescens.** Scandent shrub 12–15 ft. in height or small tree of 20 ft., extremities thick as a crow-quill, minutely tomentose-pubescent, thinly clothed with longitudinally appressed subarachnoid hairs or glabrous. Leaves oblong-elliptical or ovate-oblong, apiculate or shortly rather abruptly acuminate, base cordate, more or less coriaceous, glabrous excepting the midrib beneath, reticulate above when dry, with 5–7 principal distant lateral nervures on each side; 3–6 in. long, $1\frac{3}{4}$–$2\frac{3}{4}$ in. broad; petiole 1–2 lines. Stipules subulate, equalling or exceeding the petiole. Flowers in terminal and axillary nutant simple pale softly silky tomentose pyramidal racemes 2–3 in. long. Bracts ovate-lanceolate acute $\frac{1}{8}$–$\frac{1}{6}$ in. Pedicels $\frac{1}{12}$–$\frac{1}{4}$ in.; bracteoles subopposite, lanceolate acute entire, 1 line. Calyx-tube narrow cylindrical, $\frac{3}{4}$–$1\frac{1}{4}$ in., lobes ovate, inner ovate-rotundate. Petals oblong-elliptical, veined. Base of staminal sheath continued as a toothed ring round the faux. Ovary with traces of dissepiment. Fruit not seen.—*Acioa* (*Lorandra*) *pallescens*, Baill. in Adansonia, vii. 224 (note).

Upper Guinea. Var. *scandens.* Climbing shrub, extremities with appressed thinly arachnoid hairs, or glabrate; leaves tending to ovate-elliptical. River Muni, *Mann!* Gaboon, *Griffon du Bellay.* Var. *arborescens.* Small tree, extremities finely pubescent; leaves oblong. Old Calabar, *Mann! W. C. Thomson!*

I have not had the opportunity of examining an authentic specimen of M. Baillon's plant, but his description is a very good one, and notwithstanding slight differences, I prefer for the present to keep the above forms together.

4. **G. Mannii,** *Oliv.* Climbing shrub, attaining 15–20 ft.; extremities terete, smooth, early glabrous. Leaves elliptical, shortly acuminate or apiculate, rounded or broadly cuneate at base, thinly coriaceous, glabrous, minutely scabrid under a lens on the venation, principal lateral nerves 6–10 on each side; 5–$6\frac{1}{2}$ in. long, 2–$3\frac{1}{4}$ in. broad, petiole $\frac{1}{4}$–$\frac{1}{3}$ in., eglandular. Stipules ovate or ovate-lanceolate,

subscarious, with prominent nervation, $\frac{1}{6}$ in. long. Flowers in terminal somewhat intricate puberulous paniculate racemes and from the upper axils, usually shorter than the leaves. Bracts ovate $\frac{1}{12}$ in. or less; bracteoles minute, ovate, acute. Pedicels straight, from the last pedicels $\frac{1}{4}$ in. more or less. Calyx-tube slender, $\frac{3}{4}$ in. long, puberulous; lobes elliptic-oblong. Petals obovate-oblong, exceeding the calyx, caducous. Base of staminal sheath continued around the faux as a prominent sinuous disk. Fruit not seen.

Upper Guinea. Fernando Po, *Mann!*

5. **G. Barteri,** *Hook. f. mss.* Climbing shrub, about 7 ft. high, with greenish-white flowers (*Barter*); extremities slender glabrous. Leaves elliptical apiculate or shortly acuminate, rounded or broadly cuneate at base, glabrous and shining on both sides, principal lateral nerves 4–6 on each side, distant, not prominent; $2\frac{1}{2}$–5 in. long, $1\frac{1}{3}$–2 in. broad more or less, petiole eglandular $\frac{1}{8}$–$\frac{1}{4}$ in. Stipules narrow-linear. Inflorescence as in *G. Mannii*, puberulous. Bracts and pedicels the same. Calyx-tube very slender, $\frac{1}{2}$–$\frac{3}{4}$ in. long, outer lobes elliptical acute, inner obtuse. Petals about equalling the calyx, elliptic-oblong. Stamens 15–25, the base of the sheath continued round the faux, toothed. Fruit 1–$1\frac{1}{2}$ in. long, apparently ovoid-compressed; pericarp crustaceous; seed thinly covered with straight appressed rigid hairs.

Upper Guinea. Lagos, *Barter!* Old Calabar, *W. C. Thomson!*

Allied to *G. Mannii*, but smaller in nearly all its parts. The stipules appear diagnostic.

4. **PYGEUM,** Gært.; Benth. et Hook. f. Gen. Plant. i. 610.

Flowers occasionally polygamous. Calyx turbinate or campanulate, toothed, deciduous leaving a narrow ring. Petals 5 (10–12) or 0, inserted in mouth of calyx, small. Stamens 10–20, perigynous. Ovary sessile, narrowed into the style; ovules geminate, laterally affixed (or pendulous), collateral; stigma terminal. Fruit dry, crustaceous, subglobose or transversely ellipsoidal, 1-seeded (in *P. africanum*).—Trees or shrubs, glabrous (or tomentose). Leaves alternate, simple, petiolate, entire or crenate-serrate. Stipules minute, deciduous. Flowers small, racemose.

A small genus of the warmer parts of the Old World. The following appears to be endemic.

1. **P. africanum,** *Hook. f. in Journ. Linn. Soc. Bot.* vii. 191. Tree of 30 ft. or more; extremities, leaves and peduncles wholly glabrous. Leaves elliptic-oblong acute or shortly subacutely or obtusely acuminate, base rounded or broadly cuneate, crenate-serrate or subentire, thinly coriaceous, 3–5 in. long, $1\frac{1}{2}$–2 in. broad; petiole $\frac{1}{2}$–$\frac{2}{3}$ in. Flowers in simple solitary or fascicled racemes, 2 in. long or shorter, from the lower scale-axils of the shoots. Calyx turbinate-campanulate, with 5 short deltoid teeth. Petals very small, obovate, especially towards the

margin softly hairy. Style short. Fruit dry, depressed-globose or transversely ellipsoidal, 4–5 lines in diameter.

Upper Guinea. Camaroons mountain, 7000–7500 ft., *Mann!*
Lower Guinea. Pungo Andongo, Angola, 2400–3800 ft., *Dr. Welwitsch!*
Mozamb. Distr. Foot of Mount Tschiradzura, 3000 ft., and near Mungazi (leaves nearly entire), *Dr. Kirk!*

5. RUBUS, Linn.; Benth. et Hook. f. Gen. Plant. i. 616.

Calyx-tube shallow short, lobes 5, persistent. Petals 5 or 0. Stamens indefinite, perigynous. Carpels indefinite, inserted upon a convex receptacle; "ovules geminate, collateral, pendulous"; style subterminal. Achenes drupaceous or dry, 1-seeded; the receptacle usually becoming succulent.—Shrubs (or herbs) usually scrambling and aculeate. Leaves 3–5-foliolate, leaflets ternate or imparipinnate in Tropical African species. Stipules shortly adnate to the petiole, then narrow-linear. Flowers paniculate.

A large genus, generally diffused through both hemispheres, but most numerous in perplexing varietal or specific forms in the North temperate zone.

Leaves pinnate. Petals 0 or shorter than calyx.
- Leaflets glabrate or pubescent beneath . . . . . 1. *R. pinnatus.*
- Leaflets hoary-tomentose beneath . . . . . 2. *R. apetalus.*

Leaves (at least on flowering branches) 3-foliolate, tomentose beneath.
- Petals shorter than calyx. Stem tomentose, glands 0 or but few above . . . . . 3. *R. rigidus?*
- Petals twice as long as calyx. Stem tomentose and densely glandular-pilose . . . . . 4. *R. Steudneri.*

1. **R. pinnatus,** *Willd.*; *DC. Prod.* ii. 556. A loosely scrambling or scandent shrub, sometimes reaching 10–15 ft.; extremities finely and thinly appressed-tomentose puberulous or glabrate, aculeate, without setæ or spreading hairs, usually furrowed or somewhat angular; prickles decurved. Leaves pinnate excepting immediately under the inflorescence; lateral leaflets 2-jugate from ovate-lanceolate to ovate, acute or acuminate, rounded at the base, unequally serrate, on petiolules of $\frac{1}{8}$–$\frac{1}{4}$ in.; terminal leaflet but little larger or equalling the lower ones, all glabrous or glabrescent above, glabrate or minutely pubescent, strongly nerved and often aculeate on the midrib beneath. Panicle terminal, usually leafless, rather lax, more or less hoary-tomentose. Calyx-lobes linear-lanceolate, acuminate. Petals wanting or scarcely exceeding the thinly silky or at length glabrous carpels. Achenes dry or nearly so, sculptured.

Upper Guinea. Camaroons mountain, above 4000 ft., *Mann!* Clarence Peak, Fernando Po, and St. Thomas, 5000 ft. *Mann!*
Lower Guinea. Golungo Alto, Angola, 2400 ft., *Dr. Welwitsch!*
The same plant occurs in St. Helena and at the Cape.

2. **R. apetalus,** *Poir.*; *DC. Prod.* ii. 557. Stem softly pilose-tomentose or -pubescent, hairs spreading, aculeate, setæ 0, prickles sharply decurved. Leaves pinnate, petioles hairy and aculeate as the stem; lateral leaflets 2-jugate, all ovate or ovate-elliptical acuminate,

base rounded, unequally serrate, on petiolules usually of 1 line or less, thinly hairy above, paler and shortly hoary-tomentose or shortly thinly and softly pilose especially on the nervures beneath. Panicles terminal, pilose-tomentose, the flowers usually clustered or compact. Calyx-lobes linear-lanceolate acuminate. Petals 0 or scarcely exceeding the carpels which are glabrous, at length dry and sculptured or thinly succulent.—*R. exsuccus*, Steud.; Rich. Fl. Abyss. i. 256.

Nile Land. Abyssinia, *Schimper! Roth!*
Mozamb. Distr. Foot of Mount Tschiradzura, *Dr. Kirk!*
Originally described from Mascarene specimens.

3. **R. rigidus,** *Smith?; DC. Prod.* ii. 556. Loosely branching shrub, attaining 7–8 ft., branches closely appressed hoary-tomentose, with a few microscopic glandular hairs towards the panicle; prickles decurved. Leaves 3-foliolate on the flowering branches, glabrous above, paler hoary-tomentose beneath, leaflets more or less ovate ovate-elliptical or -rotundate, acute, unequally broadly serrate, petiolules of lateral leaflets 0 to 1 line. Panicles lax, more or less leafy. Calyx-lobes ovate-lanceolate apiculate. Petals shorter than calyx. Carpels thinly pilose, glabrescent, at length thinly succulent, "black-purple."

Lower Guinea. Huilla, Angola, 5500 ft. (*R. huillensis*, Welw. mss.), *Dr. Welwitsch!*

Differing from the above in little but the stem more loosely tomentose or pilose-tomentose, and more aculeate inflorescence, are specimens collected by Messrs. Chapman and Baines in South-West Africa, lat. 23°; no precise locality on the label. I have not seen barren shoots nor 5-foliolate pinnate leaves on either of the above plants.

4. **R. Steudneri,** *Schweinf. in Verh. Zool. Bot. Gesell. Wien.* 1868, 669. Stem angular, greyish-tomentose, and with crowded patent glandular hairs; prickles straightly reflexed, towards the apex tomentose. Leaves 3-foliolate; leaflets oval acuminate, rounded or obscurely cordate at base, doubly serrate, glabrate above, densely whitish-tomentose beneath. Panicle terminal much-branched, branches glandular-tomentose; pedicels slender, aculeate, much exceeding the tomentose eglandular calyx. Petals obovate-oblong twice as long as the calyx, purplish.

Nile Land. Abyssinia, *Steudner.*
Description taken from Dr. Schweinfurth's Memoir.

M. Richard (Fl. Abyss. i. 256–57) describes two *Rubi* gathered in Abyssinia by Messrs. Q.-Dillon and Petit, of which I have not seen specimens. They are: *R. Petitianus* (? also *R. compar*, R. Br. in Salt, App. 64). Stem and petioles tomentose. Leaflets ternate, inciso-serrate concolorous, closely pubescent (not tomentose). Sepals oval, abruptly acuminate. Petals and fruit undescribed: and *R. Quartinianus*. Stem and petioles pale-tomentose. Leaves pinnate, leaflets usually 5, whitish-tomentose beneath. Flowers solitary, or two or three on a common peduncle in the upper axils. Sepals oval-oblong acuminate. Petals 0. I take this to be probably a form of *R. apetalus*, Poir. Schimper's recent (1863–8) collections, include also two or three *Rubi* not identifiable with those in the Kew Herbarium, but no good purpose would be served by describing them from the materials as yet to hand.

6. **POTENTILLA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 620.

Flowers usually 5-merous. Calyx-tube short, lobes erect or spreading, alternating with as many bracteoles of an epicalyx. Petals obcordate to oblanceolate. Stamens indefinite. Carpels indefinite inserted upon a small dry receptacle. Achenes sessile, pericarp crustaceous.—Herbs (or shrubs). Leaves digitately or pinnately 3–5–∞ -foliolate; leaflets usually incised or serrate. Stipules adnate below to the petiole. Flowers pedicellate in corymbose cymes or solitary and axillary or leaf-opposed, yellow in tropical African species.

A large genus of the colder and temperate regions of the northern hemisphere, rare southwards. None of the following is peculiar to Africa.

Erect or ascending. Leaves pinnate. Flowers in terminal corymbs	1. *P. pensylvanica*, var.
Creeping. Leaves digitate. Peduncles solitary, axillary	2. *P. reptans.*
Diffuse. Leaves pinnately 5–3-foliolate. Peduncles solitary, leaf-opposed	3. *P. supina.*

1. **P. pensylvanica,** *Linn.* (var. *strigosa*); *Lehm. Potent.* 58. Silky or tomentose herb with erect or ascending branches, from a few inches to a foot or more in height. Radical leaves imparipinnate, usually 4–6-jugate, upper shortly petiolate or at length sessile with fewer leaflets; stipules entire or incised; leaflets from narrow-oblanceolate to obovate, pinnatifid or pinnately incised, teeth obtuse. Flowers few or many in terminal corymbose cymes. Bracts of epicalyx oblong about equalling the broader calyx-lobes. Petals yellow obovate equalling the calyx.—For copious synonymy see Lehmann, as cited.

Nile Land. Abyssinia, *Schimper* (*fide Lehmann.*)
A cosmopolitan species, of which, however, I have not seen Tropical African specimens.

2. **P. reptans,** *Linn.*; *DC. Prod.* ii. 574. Herb, with long, slender, prostrate, glabrous, or thinly pilose branches rooting at the nodes. Leaves digitate, usually 5-foliolate on long or short more or less pilose petioles; stipules oblong or ovate, usually entire. Leaflets subsessile, oblanceolate or obovate-oblong, obtuse, crenate-serrate, excepting at the cuneate base. Peduncles slender, axillary, solitary, exceeding the leaf. Bracteoles of epicalyx elliptical equalling the calyx-lobes. Petals yellow, obcordate, exceeding the calyx.—*P. abyssinica,* Rich. Fl. Abyss. i. 257 (a form with glabrous achenes and toothed stipules, according to Lehmann, Potent. 185).

Nile Land Abyssinia, *Schimper!* and others.
Common through Europe and temperate Asia.

3. **P. supina,** *Linn.*; *DC. Prod.* ii. 580. A diffuse decumbent herb, from a few inches to a foot or more in height, branching from the base, usually more or less pilose. Lower leaves pinnately 5-foliolate, upper 3-foliolate with shorter petioles; stipules linear-oblong to ovate entire. Leaflets from oblanceolate to obovate or (in radical leaves) sometimes nearly ovate, obtuse, incise-serrate. Peduncles leaf-

opposed equalling or shorter than the upper leaves, at length recurved. Bracteoles of epicalyx lanceolate or oblong, nearly equalling the calyx. Petals yellow obovate or oblanceolate, scarcely equalling the calyx.—Lehm. Potent. 193 (where synonymy is given).

Nile Land. White Nile, *Consul Petherick!* Sennaar, *Cienkowski.* Nubia, *Ehrenberg, Dr. Bromfield!* Kordofan, (*Schweinf. et Asch. Enum.*)

Widely spread in Europe and Asia; occurs also at the Cape.

7. **ALCHEMILLA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 621.

Flowers minute, hermaphrodite. Calyx-tube infundibuliform, persistent, limb 8–10-partite, lobes biseriate, equal or unequal. Petals 0. Stamens (1–) 4 or 5, alternating with the inner calyx-lobes. Margin of disk partially closing the throat of calyx. Carpels 1–5, included in the calyx-tube, style lateral or basal, stigma exserted capitate. Achenes 1 or more, enclosed in the calyx-tube.—Herbs, usually perennial, procumbent or erect, often branching from the rootstock. Leaves alternate, rotundate or reniform digitate or palmately lobed, rarely multifid. Stipules sheathing, adnate. Flowers in dense corymbose or loosely panicled cymes or racemose, rarely subsolitary, sessile or pedicellate.

A considerable genus, common to the cooler regions of both hemispheres, especially abundant on the American Andes. None of the following are clearly identifiable with extra-African species.

Decumbent or prostrate.	
Leaves undulate or lobate, lobes not exceeding ½ the radius of leaf.	
Flowers nearly or quite concealed in the axils	1. *A. cryptantha.*
Flowers in axillary racemes or fascicled on distinct peduncles.	
Leaves 7-lobed, lobes obovate-cuneate, nearly ½ of radius. Carpels 2	2. *A. abyssinica.*
Leaves 5–7-lobed, lobes rotundate, ⅓ of radius. Stipules toothed above. Carpels 5	3. *A. tenuicaulis.*
Leaves 5–7-lobed, lobes semicircular, ⅓ of radius. Stipules entire, membranous	4. *A. Gunæ.*
Leaves rotundate undulate, lobes scarcely deeper than serratures. Carpels solitary	5. *A. Rothii.*
Leaves pedate or 5–7-partite, median segments obovate .	6. *A. pedata.*
Branches erect or ascending, 1–2 ft. Flowers panicled . .	*A. elongata* (p. 379).

1. **A. cryptantha,** *Steud.; Rich. Fl. Abyss.* i. 259. Procumbent herb, branches patent-pilose rooting at the lower nodes. Leaves thinly membranous, rotundate-reniform, broadly 5-lobed, lobes rounded, very obtuse, rather deeply crenate-serrate, usually not extending over ¼ or ⅓ the radius of the leaf, thinly silky-pilose on both sides, scarcely exceeding 1 in. in breadth in our largest leaves. Stipules serrate above or toothed. Flowers concealed within the sheathing stipulate leaf-axils, shortly pedicellate or subsessile. Calyx-tube infundibuliform; outer and inner lobes of limb subequal, ovate-lanceolate acute or outer subacute. Carpels 5 or fewer, shortly stipitate, glabrous.

Nile Land. Abyssinia, *Schimper!*

2. **A. abyssinica,** *Fresen. in Mus. Senck.* ii. 161. Branches villous. Leaves subrotundate-reniform, 7-lobed, lobes obovate-cuneate nearly reaching half way to the petiole, truncate mucronate-serrate, the teeth curved, bristle-pointed, somewhat silky-villous, the nerves beneath and petioles densely villous. Racemes axillary, simple or forked. Four outer calyx-teeth smaller, each with a projecting hairy apical tuft. Carpels 2, one suppressed at length.

Nile Land. Abyssinia, *Rüppel.*

Description taken from the Memoir cited above. I have not seen any Abyssinian specimens exactly according with it. *Alchemilla Bachiti*, Hochst. (*Schweinf.*, Beitr. Fl. Æthiop. 22) I do not know. Both *A. pedata* and *A. cryptantha* are said to be from the Bachit mountains, and it may be a synonym of one of these.

3. **A. tenuicaulis,** *Hook. f. in Journ. Linn. Soc.* vii. 191. Low herb hardly rising above 2 or 3 in., with slender prostrate branches, thinly villous with spreading hairs and rooting at the nodes. Leaves rotundate-reniform 5- or 7-lobed, lobes rotundate, broadly cuneate within, about $\frac{1}{3}$ the radius of the leaf, broadly serrate, thinly pilose above, more distinctly so beneath, firmly membranous, radical leaves $\frac{1}{2}$–$\frac{3}{4}$ in. broad more or less. Petioles patent-pilose. Stipules toothed at the apex. Flowers in bracteate racemes, fascicled in the axils; bracts palmately toothed, broadly cuneate below. Calyx-lobes ovate, the outer slightly exceeding or equalling the inner. Stamens 4. Carpels 5 stipitate, 2 or 3 at length abortive.

Upper Guinea. Fernando Po, 7500 ft., and Camaroons mountain, 7000 ft., *Mann!*

This species I take to be nearly allied to *A. abyssinica*, Fres., only known to me by description.

4. **A. Gunæ,** *Schweinf. in Verh. Zool. Bot. Gesell. Wien.* 1868, 668. Perennial with divaricately spreading silky branches. Leaves on long petioles, broadly reniform, more than twice as broad as long, 5–7-lobate to $\frac{1}{3}$ of their radius, lobes broadly semi-orbicular with 6 or 7 connivent serratures, pubescent or glabrate above, silky with long appressed hairs beneath. Stipules broadly ovate, entire, membranous. Flowers not seen.

Nile Land. Near Debra Tabor, *Steudner.*

Description taken from Dr. Schweinfurth's Memoir.

5. **A. Rothii,** *Oliv.* Branches elongate, probably prostrate and rooting at the nodes, thinly pilose with spreading hairs. Leaves rotundate, the sinus either narrow or the margins overlapping, undulate-lobate, the depression in the centre of each shallow lobe nearly or quite as deep as that between the lobes, scarcely exceeding the serratures in depth, the margin uniformly crenate-serrate with 9–12 teeth to the median lobes, thinly pilose above, more distinctly beneath, 1 in. or less in diameter; petiole patent-pilose, $\frac{1}{2}$–1 in. or longer. Stipules deeply toothed. Flowers in axillary bracteate racemes exceeding the leaves; bracts herbaceous, deeply toothed. Pedicels slender, spreading or decurved, equalling or exceeding the flower. Calyx-tube hirsute-pilose,

outer teeth lanceolate, inner ovate acute exceeding the outer. Carpel solitary, subsessile.

Nile Land. Abyssinia, *Dr. Roth!*

6. **A. pedata,** *Hochst.; Rich. Fl. Abyss.* i. 260. A low diffuse decumbent herb, 2 or 3–8 in. in height, copiously branched from the rootstock; branches ascending, thinly pilose, with spreading or ascending hairs. Leaves 5-partite, or the segments exceeding $\frac{4}{5}$ of the radius, the lateral segments frequently each with an outer lobe, rendering the leaf subpedate; median segments obovate, broadly serrate in the upper half with the teeth directed towards the obtuse apex, glabrous above excepting towards the margins, thinly pilose or glabrate excepting on the midrib beneath, usually firmly membranous or subcoriaceous, $\frac{1}{2}$–$\frac{2}{3}$ in. broad; petioles scarcely equalling the lamina. Stipules entire, or with deep teeth. Flowers fascicled on short axillary bracteate peduncles, bracts palmatifid. Outer sepals oblong, inner broadly ovate, hairy within at the tip. Carpels 2, shortly stipitate.

Nile Land. Abyssinia, *Schimper! Dr. Roth!*

Richard (Fl. Abyss. i. 261) cites and describes *Alchemilla elongata*, Eckl. and Zeyh. Enum. 264, as occurring in Abyssinia, I suppose on the authority of Walpers (Rep. ii. 42). I suspect Abyssinia to be a misprint in Walpers, and that this species is confined to the Cape Flora. It is an erect or ascending plant, 1–2 ft. in height, the branches finely silky-pubescent with appressed hairs above. Leaves palmately 7-fid, the lobes obovate, $\frac{1}{2}$–$\frac{2}{3}$ the radius of the leaf, broadly crenate-serrate above, upper surface glabrous, lower thinly pilose or glabrescent. Flowers in loose panicles on slender pedicels of $\frac{1}{4}$ in. more or less.

In Schimper's recent collections (1863–8) is a fragmentary specimen of an *Alchemilla* distinct from any above described, with deeply 7-fid or -partite leaves, glabrous above, from creeping branches, and lax racemes of long-pedicelled flowers.

8. **CLIFFORTIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 624.

Flowers small, axillary, sessile, diœcious or polygamous. Male flower: Calyx 3–4 partite, segments elliptical or ovate, often pilose, imbricate. Petals 0. Stamens (indefinite or) definite; filaments filiform; anthers broad, didymous, 2-celled, dehiscing longitudinally. Ovary 0. Female flower: Calyx-tube contracted at the mouth, limb 3- or 4-partite, deciduous. Petals 0. Stamens 0 (or 3 or 4 imperfect?). Carpels 1 or 2, distinct, the ovaries included in the calyx-tube; style exserted, stigma plumose; ovule solitary, pendulous. Fruit a small nut (or subdrupaceous). — Rigid shrubs or undershrubs, the branches often almost concealed by the 1–3-foliolate stipulate leaves.

A considerable genus, restricted to South extratropical Africa, with the exception of the following species, which is common to the Cape and Angola.

1. **C. linearifolia,** *Eckl. et Zeyh.; Harv. in Fl. Cap.* ii. 301. An erect heath-like shrub, reaching 4–6 ft.; twigs shortly tomentose-pubescent or glabrate. Leaves in tufted axillary fascicles, digitately 3-foliolate or 1-foliolate, the lateral leaflets suppressed; petiole very

short sheathing, broadly winged by the membranous adnate stipules; leaflets narrow linear with revolute margins, so as to appear almost acicular, glabrous, usually from $\frac{1}{6}$–$\frac{1}{3}$ in. long (in Cape specimens sometimes shorter); occasionally the revolute margins do not meet over the under surface. Flowers almost concealed in the leaf-tufts. Male with a 4 (or 3?)-partite calyx, segments elliptical. Stamens as many as segments; female with a single carpel, and 3 or 4 stamens inserted in the throat, the anthers of which may be effete. Nut (in the Cape plant) oblong-ellipsoidal, longitudinally ridged, coriaceous.

Lower Guinea. Huilla, Angola, 4500–5500 ft., *Dr. Welwitsch!*
A form occurs with the ovaries insect-punctured and berry-like.

9. **BRAYERA,** Kunth.; Benth. et Hook. f. Gen. Plant. i. 622.

Flowers polygamo-dioicous. Calyx-tube turbinate, hirsute, glabrous and contracted at the faux within; lobes 10, 2-seriate, in male flower: outer segments (bracteoles) oblong, equalling the tube, inner obovate concave, recurved membranous much exceeding the outer: in female flower: outer ovate- or elliptic-oblong, obtuse, veined, about 3 times as long as tube, inner obovate, sometimes unequal, shorter than the outer lobes. Petals 0 or 5, much shorter than calyx-lobes, linear. Stamens inserted in the faucial annulus, indefinite, small or effete in the female flower. Carpels usually 2, closely embraced by the calyx-tube, distinct, ovary 1-celled, with 1 pendulous ovule, silky above, narrowed into the style, stigma dilated, capitate, rugulose. Ripe fruit. . . . .—Tree; leafy extremities annulate from the scars of the sheathing stipulate leaf-base, rings at first hirsute with ascending hairs. Leaves tufted, imparipinnate; leaflets membranous, oblong-lanceolate, acuminate, obtusely serrate, at length glabrous above, margin and under surface more or less pilose; stipules 1–3 or 4 in. long, adnate to the petiole nearly throughout. Flowers in ample terminal much-branched pilose or pubescent panicles, with ample membranous veiny bracts at each node, each with a pair of (or 3) rotundate sessile bracts at the base of the calyx-tube.

Peculiar to Abyssinia.

1. **B. anthelmintica,** *Kunth; DC. Prod.* ii. 588. Leaflets all sessile, the lateral in about 5 pairs with an obliquely cordate base, varying to 3 or 4 in. in length; minute leafy lobes are intercalated between the jugæ. Panicles varying in length to 1 ft. or more.—Bruce, Abyss. (*Cusso* or *Banksia abyssinica*) vii. 181. t. 22, 23; *Hagenia abyssinica,* Willd. Sp. Pl. ii. 331.

Nile Land. Abyssinia! *numerous collectors.*
A celebrated anthelmintic.

10. **ROSA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 625

Flowers rather large, hermaphrodite. Calyx-tube dilated, narrowed at mouth; limb 5-partite, segments spreading entire or pinnately

toothed. Petals 5, sessile, spreading. Stamens indefinite, inserted in mouth of calyx-tube; filaments free, filiform. Carpels indefinite, free, sessile at base of calyx-tube; ovary 1-celled, with a pendulous ovule. Achenes indefinite, included in the fleshy persistent calyx-tube.—Shrubs, often scandent; usually aculeate. Leaves alternate, imparipinnate; stipules adnate to the petiole. Flowers solitary, or in corymbose cymes, white, red or yellow.

A considerable genus, several of the species of which are very variable; most abundant in the north temperate zone of the Old World.

1. **R. abyssinica,** *R. Br. in Salt. App.* 64; *Lindl. Ros. Monog.* 116, t. 13. Scandent; branches glabrous, aculei scattered or rather crowded, more or less recurved. Leaves 5–7-foliolate, ovate-elliptical or elliptical, broadly pointed or obtuse, rounded at base (cuneate in Lindley's figure), acutely and nearly simply serrate, glabrous; rachis minutely glandular, sparingly aculeate; stipules gland-margined. Flowers usually in terminal corymbose cymes of 2–6 or 8 or subsolitary; bracts linear-lanceolate, acuminate; peduncles and calyx minutely appressed pubescent or puberulous. Calyx-teeth lanceolate, elongate-acuminate, 3 with 1–3 short setiform segments below. Styles free, exserted, very thinly pilose above. Fruit (fide *Rich.*) ovoid, glabrous, apex truncate. —*R. Schimperiana*, Hochst. et Steud. in Pl. Schimp. Abyss.; Rich. Fl. Abyss. i. 261.

Nile Land. Abyssinia, *Schimper! Salt*, and others. (Var. with glabrate or minutely glandular peduncles. Ankober, Abyssinia, *Dr. Roth!*)

Probably not specifically distinct from some extra-African form, but it would be unsafe to identify it with our small material. Dr. Lindley (l. c.) puts it near *R. sempervirens;* Mr. Baker suggests that it may be a form of *R. systyla.*

We have besides from Ankober, collected by Dr. Roth, a solitary specimen, perhaps a variety of the foregoing, which approaches *R. moschata* in its many flowered inflorescence.

Richard (Fl. Abyss. i. 262) describes, under the name *R. sancta*, a Rose cultivated around churches in the province of Tigre, which he says is nearly identical in habit with *R. centifolia*, L., differing in its glabrous glaucous eglandular branches, armed with but few recurved aculei, and in its much smaller flowers, with glaucous glabrous peduncles. I have not seen a specimen.

11. **NEURADA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 625.

Calyx-tube shallow, cupuliform, at length nearly flat below, depressed conical above, contracted and shortly 5-lobed at the mouth, lobes deltoid or ovate-lanceolate, alternating with as many exterior subulate or at length aculeiform bracteoles. Petals 5, inserted in throat, obovate-cuneate or oblanceolate, very small and little exceeding the calyx. Stamens 10 (or thereabouts), short, distinct, inserted in throat of calyx; anthers 2-celled. Carpels 10 (or more?), more or less coherent and adnate with the calyx; ovaries, at least the outer whorl, horizontal, narrowed into the scarcely exserted styles. Ovule solitary. Fruit dry, orbicular, depressed-conical, spinose-muricate, tomentose, often persisting long after germination of one or more of its seeds.—

A woody tomentose annual, with diffuse or procumbent branches. Leaves alternate, petiolate, ovate-oblong or ovate, obtusely serrate-pinnatifid, obtuse, cuneate or rounded at base. Stipules concealed in the tomentum or obsolete. Flowers axillary, solitary, pedunculate.

1. **N. procumbens,** *Linn.; DC. Prod.* ii. 548. Leaves usually $\frac{1}{3}$–$\frac{3}{4}$ in. long, with 1- to 3 or 4 obtuse lobes on each side, tomentose; petiole equalling or shorter than lamina. Flowers roundish, densely tomentose and with projecting setiform bracteoles; 2–3 lines in diameter. Fruit $\frac{1}{2}$—$\frac{3}{4}$ in. in diameter, orbicular with the margin and upper surface aculeate with nearly equal prickles, or symmetrically spinosely-lobate with few aculei above.

Nile Land. Nubia (*Schweinf. et Asch. Enum.*)

Also in Northern Africa and eastward through Arabia to Scinde.

The small allied Cape genus of low annual herbs *Grielum*, has not, that I am aware of, been found north of the Tropic of Capricorn, though probably intertropical in S.W. Africa. It differs in its large flowers with conspicuous petals, and in the absence of the calycine bracteoles.

ORDER XLIX. SAXIFRAGACEÆ. (By Prof. Oliver.)

(SAXIFRAGEÆ AND BREXIEÆ.)

Flowers regular, hermaphrodite. Calyx 5-merous, free or more or less adnate to the ovary, lobes imbricate or valvate. Petals perigynous epigynous or subhypogynous, alternate with calyx-lobes, rarely 0. Stamens iso- or diplo-stemonous, inserted with the petals; filaments free; anthers 2-celled, dehiscing longitudinally. Ovary free or adnate more or less to inferior, 5–2- or 1-celled; ovules indefinite; styles usually 2, free or cohering or 1 in *Brexia.* Fruit a capsule or drupaceous. Seeds indefinite.—Herbs. Leaves rarely opposite, exstipulate. Inflorescence various. (Shrub with coriaceous leaves in *Brexia.*)

Tribes of a rather large Natural Order, most of the genera of which affect a cool or even arctic or alpine climate.

Herbs. Styles 2.
- Stamens 10. Ovary 2-celled, with axile placentas . . . . . 1. SAXIFRAGA.
- Stamens 5. Ovary 1-celled, with 2 pendulous placentas . . . . 2. VAHLIA.

Shrub. Style 1. Ovary 5-celled . . . . . 3. BREXIA.

1. **SAXIFRAGA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 635.

Calyx more or less deeply 5-lobed, tube free or coherent to the ovary. Petals 5, perigynous or subhypogynous. Stamens 10 or 5, inserted with the petals. Ovary free or more or less adnate to the calyx-tube, 2-celled; styles 2;, ovules indefinite on axile placentas. Fruit a 2-beaked many-seeded capsule, opening at the apex between the remains of the styles.—Herbs, very various in habit. Leaves radical or cauline, rarely opposite, entire or lobed or laciniate. Flowers white, yellow or purple, variously cymose or solitary.

A large genus, chiefly characteristic of alpine or arctic regions in the Northern hemisphere.

The following appears peculiar to the Abyssinian highlands.

1. **S. hederæfolia,** *Hochst.; Rich. Fl. Abyss.* i. 317. A low diffuse or decumbent herb, branched from the base, glabrous or with few scattered hairs. Leaves radical and cauline, the former on long flaccid petioles, reniform with about 5 (3–7) shallow broadly rounded lobes, the median broadest, upper cauline leaves palmatifid or 3-fid with shorter petioles. Flowers solitary, "yellow," pedunculate, leaf-opposed. Calyx deeply 5-fid, lobes ovate, obtuse, glandular. Petals obovate or obovate-oblong, obtuse, 3-pliveined, subsessile, 2–3 times longer than calyx. Ovary about $\frac{1}{3}$–$\frac{1}{2}$ inferior; styles short, divergent in fruit.

Nile Land. Abyssinia, at a great elevation, *Schimper! Petit!*
Occasionally floating in rivulets, (*Rich.*).
Allied to *Saxifraga hederacea*, Jacq.

2. VAHLIA, Thunb.; Benth. et Hook. f. Gen. Plant. i. 637.

Calyx-tube campanulate or hemispherical, adherent throughout to the ovary; limb 5-partite, lobes valvate. Petals epigynous, not or scarcely exceeding the calyx. Stamens 5, epigynous. Ovary inferior, 1-celled with 2 pendulous multiovulate placentas; styles 2, stigma capitellate. Capsule many-seeded, dehiscing at the apex.—Herbs, usually pubescent or glandular, erect or diffuse, annual or biennial. Leaves opposite, entire. Flowers axillary, usually geminate, subsessile or pedunculate.

A small genus of Africa and the warmer parts of Asia.

Leaves ovate or ovate-lanceolate. Flowers sessile . . . . 1. *V. viscosa.*
Leaves linear or nearly so.
  Flowers pedunculate. Calyx-lobes shorter than or not exceeding tube . . . . . 2. *V. oldenlandioides.*
  Flowers sessile or pedunculate. Calyx-lobes exceeding tube 3. *V. capensis.*

1. **V. viscosa,** *Roxb.; Hook. f. et Thom. in Journ. Linn. Soc.* ii. 74. Annual diffuse or erect branching glandular-pilose or pubescent herb, $\frac{1}{2}$–1 ft. or more in height. Leaves ovate, acute or obtuse, sessile or all or the lower only ovate-lanceolate or oval narrowed to the base, $\frac{1}{2}$ to over 1 in. long in luxuriant specimens. Flowers sessile or subsessile, geminate or solitary in nearly all or at least in the upper axils. Calyx-teeth ovate, acute, equalling the campanulate tube. Petals nearly equalling calyx-lobes, ovate-rotundate, slightly narrowed to broad base or obovate-oblong, frequently apiculate. Filaments filiform, with a very minute hairy scale at base. Styles equalling calyx-lobes.—*V. Weldenii*, Reichb. Icon. Bot. Exot. 91; DC. Prod. iv. 53; *V. sessiliflora*, DC. Prod. iv. 54, fide Hook. f. et Thom. l. c. *Bistella geminiflora*, Delile, Voy. à Méroé, 97, t. ii. fig. 2.

Upper Guinea. Senegambia, *Leprieur and Perrottet, Roger!* (A narrow-leaved variety, regarded as *V. ramosissima*, A. DC. by M. Gay.)
North Central. Kouka, *E. Vogel!*

Nile Land. Sennaar and Kordofan, *Kotschy!* Khartoum, *Consul Petherick!*
Also in Egypt and eastward in Persia and India. The Indian form seems to have generally narrower leaves, varying to lanceolate or oval-oblong.

2. **V. oldenlandioides,** *Roxb.; Hook. f. et Thom. in Journ. Linn. Soc.* ii. 74. An erect or diffuse branching annual clothed more or less with crisped pubescence or glandular-pubescent above, 2 or 3 in. to 1 ft. Leaves linear or linear-oval acute, usually from $\frac{1}{2}$–2 in. long, $\frac{1}{12}$–$\frac{1}{4}$ in. broad. Peduncles 2-flowered from the upper axils, erect, several times longer than the flowers or in dwarfed forms scarcely longer than the calyx-tube; pedicels very short, rarely exceeding the calyx-tube. Calyx-lobes ovate-lanceolate acute, equalling the tube at flowering, at length often shorter. Petals obovate-oblong or -rotundate. Filaments not perceptibly appendaged, twice or more than twice as long as the anther. Styles short, divaricate.—*V. Oldenlandiæ*, DC. Prod. iv. 54; *V. silenoides*, A. DC. Prod. iv. 54; *V. ramosissima*, A. DC. l. c. (ex descr.); *V. cordofana*, Hochst. in Herb. Kotsch. Nub. 57; *V. macrantha*, Kl. in Peters' Mossamb. Bot. 175 (ex descr.).

Upper Guinea. Senegambia, *Brunner*, and others. Borgu, Nigritania, *Barter!*
North Central. Bornu, *E. Vogel!*
Nile Land. Kordofan, *Kotschy!*
Mozamb. Distr. Zambesi, *Dr. Peters.*
Also in India.
V. tomentosa, A. DC. Prod. l.c. I do not know from authentic specimens. It is from Cayor in Senegambia. The description is too brief, and affords no character by which to distinguish it from species here described.

3. **V. capensis,** *Thunb.; DC. Prod.* iv. 53. Erect or diffuse herb from a few inches to 1 ft. or more in height, shortly crisped-pubescent or glabrate, occasionally woody at the base and probably then biennial or perennial. Leaves linear acute, $\frac{1}{3}$–1 in. long. Flowers geminate from all the upper axils, either subsessile or on erect slender peduncles nearly $\frac{1}{2}$ in. long; pedicels usually very short. Calyx-teeth lanceolate or linear-lanceolate acute or acuminate, exceeding the campanulate tube. Petals varying from orbicular subsessile to oblanceolate acute, usually nearly equalling the calyx. Anthers oblong or oval, equalling or exceeding the filaments. Styles slender, equalling or exceeding the calyx-lobes.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!* Var. *verbasciflora* (Welw. mss.) flowers subsessile; petals orbicular. Mossamedes, *Dr. Welwitsch!*
Also at the Cape. Dr. Welwitsch's two forms I should certainly have regarded as specifically distinct from each other, were it not that the Cape specimens in the Kew Herbarium lead me to suspect they may be varieties of one variable type. If it prove otherwise, the name *verbasciflora* proposed by Dr. Welwitsch for the broad-petalled sessile-flowered form may be adopted.

3. BREXIA, Thouars; Benth. et Hook. f. Gen. Plant. i. 645.

Calyx 5-partite, lobes coriaceous, imbricate, much shorter than petals. Petals elliptical, coriaceous, spreading, contorted-imbricate in bud. Stamens 5, subhypogynous; filaments slightly dilated below, alternating with the toothed lobes of the disk. Ovary superior, taper-

ing upwards into the style, 5-celled, with indefinite ovules. "Fruit drupaceous, woody, 1-celled, many-seeded. Seeds with very thin albumen."—Shrubs or small trees, wholly glabrous. Leaves alternate, coriaceous, entire or toothed. Flowers rather large, firm in texture, in pedunculate axillary umbellate cymes.

A small genus confined to the Mascarene islands and Mozambique coast.

1. **B. madagascariensis,** *Bot. Reg.* t. 730. (Var. *mossambicensis*). Shrub of 10–15 ft., wholly glabrous. Leaves coriaceous, shining, obovate, occasionally retuse, obscurely notched or subentire, rounded or broadly cuneate at base, 3–4½ in. long, 2–2½ in. broad; petiole ½ in. more or less. Peduncles axillary, the subtending leaf sometimes minute, at length spreading or decurved, compressed, often bearing a small coriaceous elliptical bract at the apex; flowers 1, 2, or few on pedicels of ¼–½ in., 1 in. or more in diameter, greenish-white. Fruit oblong-ellipsoidal acuminate, nearly 3 in. long, 1¼ in. diameter (from drawing).—*B. heterophylla,* Noronh.; Tulasne in Ann. Sc. Nat. sér. iv. viii. 159 (which see for further synonymy).

Mozamb. Distr. Amongst mangroves, Mouth of Zambesi, *Dr. Kirk!*

Also at Delagoa Bay and in Madagascar. The Delagoa plant agrees well with the above, which differs from the usual Madagascar form in its broader leaves and few-flowered peduncles. It is a very variable species, especially in the form of the leaves, which are sometimes nearly 1 ft. long and not 1½ in. broad, with coarsely spinulose-serrate leaves.

ORDER L. CRASSULACEÆ. (By Mr. James Britten.)

Flowers hermaphrodite, regular. Calyx persistent, free, 4–5- rarely 6-partite, or 5- rarely 10-fid. Petals as many as the sepals, free or more or less connate, often persistent, erect or spreading or with the claw erect and the limb spreading. Stamens perigynous or scarcely hypogynous, equalling or doubling the petals in number, free, or adnate to the petals; filaments filiform or subulate; anthers linear oblong or didymous, dorsally affixed, dehiscing longitudinally. Scales hypogynous at the base of the carpels, oblong cuneate or linear, rarely longer than broad. Carpels as many as the petals, free or rarely more or less connate, unilocular; styles short or elongated, subulate or filiform; stigmas capitellate, truncate, often oblique. Ovules many, rarely solitary. Follicles membranaceous or coriaceous, many- or few-seeded, dehiscing by the ventral suture. Seeds usually minute, oblong; testa membranaceous or subcoriaceous; albumen fleshy.—Herbs or suffruticose, varying in habit, usually fleshy or succulent, rarely pubescent or pilose. Leaves alternate or opposite, sometimes connate, simple or rarely laciniate or imparipinnate. Flowers usually cymose, with or without bracts.

An Order widely dispersed in temperate and subtropical regions, especially of the Old World.

Stamens isomerous with the petals. Petals free or scarcely united at the base.
- Flowers 4–5-merous, small, mostly annual, herbs . . . . . 1. TILLÆA.
- Flowers 5-merous. Suffruticose fleshy perennials . . . . . 2. CRASSULA.

Stamens twice as many as the petals.
- Petals united nearly to the middle, or beyond.
  - Calyx shortly 4-fid, large . . . . . 3. BRYOPHYLLUM.
  - Calyx 4-partite, rarely 4-fid . . . . . 4. KALANCHOE.
  - Calyx 5–6-partite . . . . . 5. COTYLEDON.
- Petals free, or scarcely united at the base.
  - Flowers 5-merous . . . . . 6. SEDUM.
  - Flowers 6-merous . . . . . 7. SEMPERVIVUM.

1. TILLÆA, Linn.; Benth. et Hook. f. Gen. Pl. i. 657.

Calyx-lobes 4–5. Petals 4–5, free or connate at the base. Stamens 4–5, filaments filiform; anthers 2-celled. Scales 4–5, linear or 0. Ovary of 4–5 free carpels; narrowed into short subulate styles, with minute stigmas; ovules 1 or many in each carpel. Follicles 2- or many-seeded.—Aquatic or terrestrial herbs, often very small, subsucculent, glabrous. Leaves opposite, cylindrical subulate or flat, quite entire. Flowers minute, axillary, solitary or cymose, white or red, often fasciculate.

A genus of wide distribution, scarcely separable from *Crassula*, comprising about twenty species.

Pentamerous, rarely tetramerous.
- Leaves narrow, sessile; petals connate at the base; carpels 2-seeded; scales small.
  - Stems annual, herbaceous.
    - Flowers sessile . . . . . 1. *T. pentandra.*
    - Flowers pedicellate . . . . . 2. *T. pharnaceoides.*
  - Stem perennial, slightly ligneous at the base . . . . . 3. *T. subulata.*
- Leaves nearly as broad as long, petiolate; petals free; carpels many-seeded; scales 0 . . . . . 4. *T. alsinoides.*

Tetramerous.
- Pedicels longer than, or equalling, the leaves . . . . . 5. *T. Vaillantii.*
- Pedicels shorter than the leaves . . . . . 6. *T. aquatica.*

1. **T. pentandra,** *Royle, Illust. Bot. Himal.* 222 (name only). Stems decumbent, branched; internodes shorter than the leaves in wild specimens. Leaves subulate, acuminate, 2–3 lines long, connate at the base. Flowers axillary, solitary in the upper axils, 2–3 together in the lower, sometimes 4-merous. Calyx-segments lanceolate acuminate. Petals ovate acuminate, white, not exceeding the sepals. Scales cuneate, truncate.—*Crassula* (*Disporocarpa*) *Schimperi*, C. A. Meyer. Ind. Sem. viii. 57; Walp. Rep. ii. 254. *Disporocarpa pentandra*; Asch., Schweinf. et Ascherson, Enum. 271. *Combesia Schimperi*, Schwf., Flora Æthiop. 80.

Upper Guinea. Camaroons mountains, 8000 ft. (Nov.), *Mann!*
Nile Land. Mountains of Abyssinia, *Parkyns! Plowden!*
Lower Guinea. Benguela, Huilla, and Angola, Pungo Andongo, *Dr. Welwitsch!*
Specimens from the last-named locality have longer leaves than other Tropical African examples; and corresponding variation is noticeable in Indian specimens.
Also in the Himalayas and Nilgherries.

2. **T. pharnaceoides,** *Hochst. in Schimp. Hb. Abyssin.* 104. Stem decumbent or erect, branched, leafy, internodes longer than the leaves. Leaves ovate-lanceolate or lanceolate, acuminate, 2–4 lines long, connate at the base. Flowers in dense axillary clusters. Calyx-segments very acute, lanceolate, exceeding the petals. Petals connate, "lanceolate acuminate, or hair-pointed." Carpels reddish.—*Combesia abyssinica*, A. Rich. Fl. Abyss. i. 307; Walp. Ann. ii. 667. *Crassula* (*Disporocarpa*) *pharnaceoides*, C. A. Meyer, Ind. Sem. viii. 56; Walp. Rep. ii. 254. *C. campestris*, Eckl. et Zeyh. Herb. 1873; Harv. Fl. Cap. ii. 351. *C. Turrita*, Thunb., is erroneously cited as a synonym in Walp. Rep. ii. 254.

Upper Guinea. Camaroons mountains, 9000 ft. (Nov.), *Mann!*
Nile Land. Abyssinia, *Schimper! Quartin-Dillon.*
Also in S. Africa and N.W. Himalayas.

3. **T. subulata,** *Benth. et Hook. f. Gen. Plant.* i. 658. Stem perennial, somewhat woody at the base, thick, as are also the principal branches, 3–6 in. high, ascending or erect, with opposite ascending or erect leafy branches. Leaves connate, spreading, 3–4 lines long, subulate, mucronate, rigid, somewhat fleshy. Flowers subsessile, minute, "green," in dense fascicles in the axils of the upper and sometimes of all but the lowest, leaves; fascicles much shorter than the leaves; bracts foliaceous. Calyx nearly as long as the petals, segments lanceolate acute. Petals lanceolate, longer than the stamens.—*Thysantha subulata*, Hook. Ic. Pl. t. 590. *Crassula subulata*, Harv. Fl. Cap. ii. 352.

Lower Guinea. Benguela, Huilla, *Dr. Welwitsch!*
In most Cape specimens, the stems and leaves are longer, more slender, and more ascending than in Tropical African examples. I cannot, however, find any characters by which to separate the above as a species; and some Cape specimens nearly correspond with it even in these particulars.

4. **T. alsinoides,** *Hook. f. in Journ. Linn. Soc.* vii. 192. Stems decumbent, branched, leafy, slender, rooting at the nodes. Leaves ovate-oblong, subacute, obscurely 3-nerved, about $\frac{1}{3}$ in. long; petioles sheathing, connate at the base, the lower nearly as long as the leaves, the upper much shorter. Flowers axillary, solitary, on slender pedicels often longer than the leaves. Calyx-segments lanceolate, acute, equalling the petals. Seeds oblong, reddish-brown. Flowers "white, $\frac{1}{3}$ in. in diameter."

Upper Guinea. Fernando Po, 7500 ft., *Mann!*
Nile Land. Abyssinia, *Roth!*

5. **T. Vaillantii,** *Willd. Sp. Plant.* i. 720. Stems dichotomous, much branched, erect, 1–2 in. high. Leaves subulate, subacute, fleshy, connate at the base, 1–2 lines long. Flowers pedicellate, pedicels equalling or usually exceeding the leaves. Calyx divided about halfway down, segments obtuse. Petals exceeding the calyx, ovate obtuse, spreading, "pale pink or white;" scales linear. Carpels many-seeded, subglobose.—DC. Pl. Grasses, t. 74. *Bulliarda Vaillantii*, DC. Prod.

iii. 382; A. Rich. Fl. Abyss. i. 306; Don, Gen. Syst. iii. 99; Harv. Fl. Cap. ii. 329. *Tillæa aquatica*, Lamarck, Illust., t. 90, non Linn.

Nile Land. Mountains of Abyssinia, *Quartin-Dillon.*
Also occurs in N. and S. Africa, and in S. Europe.

6. **T. aquatica,** *Linn. Fl. Suec. No.* 156. Stem erect or creeping, not much branched, not dichotomous, 3–4 in. long. Leaves linear-lanceolate, subacute, rather fleshy, connate at the base, 2–3 lines long. Flowers subsessile. Petals oblong, acute, connivent. Carpels ovate-oblong. In other respects like the preceding.—*Bulliarda aquatica*, DC. Prod. iii. 382; *B. abyssinica*, A. Rich. Fl. Abyss. i. 306; *B. Vaillantii*, Schimper, non DC.

Nile Land. Abyssinia, *Schimper! Dillon!*
Also in North Europe and Germany.

2. **CRASSULA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 657.

Flowers pentamerous. Calyx 5-partite or 5-fid, lobes erect or spreading. Petals 5, free or connate at the base, erect or spreading. Stamens 5, as long as or shorter than the petals. Scales various, very short in Tropical African species. Carpels 5, narrowed into short styles with small stigmas; ovules numerous. Follicles 5, many-seeded.—Herbs, with thick leaves and stems. Leaves opposite, connate, fleshy, entire, glabrous or pubescent, with cartilaginous margins. Flowers small, white or rose-coloured, cymose.

A large genus, of about 120 species, the great majority of which are peculiar to the Cape. The Tropical African species are endemic.

Leaves linear-lanceolate, 1–6 in. long	1. *C. abyssinica*
Leaves obovate-lanceolate, ½ in. long	2. *C. globularioides.*
Leaves obovate, 2–3 lines long	3. *C. sediformis.*

1. **C. abyssinica,** *A. Rich. Fl. Abyss.* i. 309. Root tuberous, subnapiform, fibres few, thick, descending. Stem erect, 6 in.–2½ ft. high, simple, cylindrical, more or less purplish, papillose throughout, or sometimes glabrous in the lower portion. Radical leaves 3–6 in. long, linear-lanceolate, acute or subacute, fleshy, erect, glabrous; stem-leaves 1–3 in. long, connate in an elongate sheath nearly an inch long, often somewhat glaucous, broadly linear or oblong or even subcordate, obtuse; bracts foliaceous; margins of leaves and bracts fimbriate-papillose. Flowers numerous, small, "white or purple," star-like when expanded, shortly pedicellate, in much-branched spreading rounded panicles, or in densely congested many-flowered cymes arranged in a compound corymb 2–4 in. broad. Calyx-lobes glabrous, oblong-ovate or lanceolate, acute or subacute. Petals oblong-lanceolate, acute or obtuse, free or subconnate at the base, scarcely twice as long as the calyx. Stamens equalling or rather shorter than the petals. Squamulæ very small, truncate, cuneate-obcordate. Carpels smooth, oblong, acuminate.—Walp. Ann. ii. 667. *C. Mannii*, Hook. f. in Journ. Linn. Soc. vii. 193. *Rochea dichotoma*, Hochst., and *R. dichotoma*, Hochst. in

Hb. Schimp. Abyss. *C. puberula*, R. Br. in Salt, Abyss. App. (name only).

Upper Guinea. Camaroons mountains, 6000–10,000 ft., *Mann!*
Nile Land. Mountains of Abyssinia, *Schimper! Dillon! Roth! Parkyns! Salt!*
Lower Guinea. Angola, Pungo Andongo, and Benguela, Huilla, *Dr. Welwitsch!*
Very variable in size. *C. Mannii* is a short stout form, with smaller flowers than the type. *C. puberula* is a short slender form with narrow leaves, but does not appear specifically distinct.

2. **C. globularioides,** *Britten.* Rhizome thick, creeping, emitting short leafy shoots barren or bearing peduncles; barren shoots terminating in a rosette of leaves. Leaves obovate-lanceolate, sometimes almost orbicular, $\frac{1}{2}$ in. long or rather more, on flowering shoots opposite, connate, internodes scarcely perceptible; fleshy, glabrous, obtuse, closely fringed with white membranous deflexed teeth. Scape papillose, simple, 2–3 in. high, with two pairs of connate, lanceolate, obtuse or subacute bracts, fringed like the leaves, one pair near the base, the other shortly below the inflorescence. Flowers in compact, rounded, terminal cymes, or in subdense forking panicles, very shortly pedicellate. Bracteoles linear-lanceolate. Calyx about 1 line long, fringed like the leaves, segments lanceolate, obtuse. Corolla twice as long as the calyx, petals free or scarcely united at the base, thick, ovate-lanceolate, obtuse, ascending, slightly spreading. Carpels dark, ovate, acuminate. Squamulæ minute.

Mozamb. Distr. Zambesia, Mount Chiradzura, *Dr. Meller!*

3. **C. sediformis,** *Schweinf. Flora Æthiop.* 80. "Herbaceous, stem $\frac{1}{2}$–2 in. high, bialate; leaves obovate or oblong-obovate, 4–5 millimetres long; calyx-segments triangular, rather obtuse; petals broadly ovate, obtuse, white or blue at the base, a little longer than the sepals. Habit of *Sedum cæruleum*, Vahl.—*Crassularia sediformis*, Hochst. in Buchinger's Verzeichniss, No. 126."

Nile Land. Mountains of Abyssinia, *Schimper.*
Description from Schweinfurth.

3. BRYOPHYLLUM, Salisb.; Benth. et Hook. f. Gen. Plant. i. 658.

Calyx inflated, cylindrical or tetragonous, shortly 4-fid, valvate. Corolla urceolate or subcampanulate, the limb shortly 4-fid, spreading. Stamens 8, in two rows, inserted in the middle of the corolla-tube; filaments filiform; anthers oblong, shortly exserted. Scales free or adnate to the carpels. Carpels 4, free, or connate at the base, elongate, narrowed into elongated, connivent, exserted styles, with capitellate stigmas; ovules in each carpel numerous. Follicles 4, many-seeded.—Tall, stout, fleshy herbs, shrubby at the base. Leaves opposite, petiolate, simple or unequally pinnate, crenate. Flowers rather large, nodding, in many-flowered paniculate cymes, greenish-white or red; branches of the panicle opposite.

A genus of four species, of which two are confined to Madagascar, and one to the Cape; the fourth is common to the tropics of both hemispheres.

1. **B. calycinum,** *Salisb.; DC. Prod.* iii. 396. Shrubby, 2–4 ft. high, branched from the base, glabrous throughout. Barren stems ascending; flowering stems erect, cylindrical, spotted with dark purple. Leaves fleshy, crenate, ovate orbicular, or unequally pinnate with ovate segments, the terminal one larger than the rest. Flowers $1\frac{1}{2}$–2 in. long, pendulous. Calyx inflated, 1–$1\frac{1}{2}$ in. long, green, striped with purple at the base. Corolla-tube green below, bright reddish-purple in the exserted portion, globose-octagonous at the base, abruptly constricted immediately above, then produced into an elongated, 4-angled, ventricose tube; limb 4-fid, segments abruptly acuminate, very acute, spreading. Stamens slightly exceeding the corolla-tube. Styles equalling the stamens, erect, filiform. Stigmas sparingly papillose. Squamulæ truncate, short, nearly as broad as long, free, or very slightly adhering to the carpels.—Bot. Mag. t. 1409.

Upper Guinea. Prince's Island, *Mann!* Sierra Leone, *Barter!*
Nile Land. "Planted by huts in Madi; said to have medicinal properties; also grows wild in dells," 635, *Speke and Grant!*
Lower Guinea. Angola, Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Zambesia, *Dr. Kirk!*
Also in Madagascar and Mauritius.
For the above description of the flowers I am indebted to Dr. Welwitsch.

4. **KALANCHOE,** Linn.; Benth. et Hook. f. Gen. Pl. i. 659.

Calyx 4-partite, rarely 4-fid, segments linear-ovate or subulate, shorter than the corolla-tube, usually deciduous. Corolla hypocrateriform, tube usually urceolate, limb 4-partite, spreading (except in *K. humilis*), persistent. Stamens 8, adnate to the corolla-tube, in two series, all antheriferous, filaments rather short; anthers oblong, included. Squamulæ 4, linear or oblong. Carpels of the ovary 4, adnate to the base of the corolla-tube (except in *K. humilis*), lanceolate, narrowed into slender styles with obliquely truncate stigmas; ovules many, multiseriate. Follicles membranaceous, many-seeded.—Robust erect herbs or shrubs. Leaves fleshy, opposite, sessile or petiolate, entire crenate or pinnatifid. Flowers rather large, usually in many-flowered paniculate cymes, yellow purple or scarlet.

A genus of about thirty species, having its head-quarters in Tropical Africa, but also represented at the Cape, in Tropical Asia, and in Brazil.

Caulescent.
Calyx 4-partite.
Corolla-tube 1–2 in. long.
Plant tomentose . . . . . 1. *K. Schimperiana.*
Plant glabrous.
Flowers yellow . . . . . 2. *K. Quartiniana.*
Flowers purplish . . . . . 3. *K. grandiflora.*
Corolla-tube rarely exceeding $\frac{1}{2}$ in. long.
Leaves pinnatifid . . . . . 4. *K. laciniata.*

Leaves entire, lanceolate.
Plant glabrous, 2–3 ft. high . . . . . 5. *K. brachyloba.*
Plant glabrous, 6–10 in. high . . . . . 6. *K. angustifolia.*
Plant pubescent . . . . . 7. *K. platysepala.*
Leaves entire or coarsely crenate, the lower ovate or ovate-lanceolate.
Plant, or at least inflorescence, glabrous.
Flowers in racemose cymes . . . . . 8. *K. Afzeliana.*
Flowers in corymbose cymes.
Inflorescence glaucous . . . . . 9. *K. glaucescens.*
Inflorescence glabrous, not glaucous.
Corolla-tube ¾ in. long, or more . . . . . 10. *K. Welwitschii.*
Corolla-tube ½ in. long, axillary peduncles many-flowered . . . . . 11. *K. crenata.*
Corolla-tube ½ in. long, very slender, axillary peduncles 2–5 flowered . . . . . 12. *K. stenosiphon.*
Leaves glabrous, inflorescence hispid or glandular-pubescent.
Flowers scarlet . . . . . 13. *K. coccinea.*
Flowers yellow.
Corolla-tube ½ in. long . . . . . 11. *K. crenata.*
Corolla-tube less than ½ in. long . . . . . 14. *K. brachycalyx.*
Whole plant pubescent . . . . . 15. *K. velutina.*
Calyx 4-fid . . . . . 16. *K. glandulosa.*
Acaulescent or subacaulescent.
Cymes dense . . . . . 17. *K. scapigera.*
Cymes lax . . . . . 18. *K. humilis.*

1. **K. Schimperiana,** *A. Rich. Fl. Abyss.* i. 310. Whole plant tomentose. Stem dilated, thickened and somewhat woody below, conspicuously marked with the scars of the fallen leaves, terete; leaves ovate-orbicular, the upper somewhat spathulate, obtuse, crenate, 2–4 in. long, narrowed at the base into short amplexicaul petioles; bracts and bracteoles sessile, slightly amplexicaul, lanceolate, acute. Flowers orange-yellow, in a rather dense much-branched trichotomous corymbose cyme. Pedicels 1–1½ in. long. Calyx-segments lanceolate-oblong, acute, 1–1¼ in. long, often spreading; corolla-tube slender, 2–2½ in. long, limb 1–1½ in. across, pubescent or almost glabrous, with broadly ovate acuminate (sometimes abruptly acuminate) segments. Squamulæ linear, brown, acute, 3–4 lines long, bifid at the apex. Carpels glabrous, narrow oblong, ¾ in. long, elongated into the persistent style. Seeds black, ½ line long.—*Cotyledon* (*Verea*) *deficiens*, Hochst. et Steud. in Hb. Schimp. Abyss., non Forsk.

Nile Land. Abyssinia, *Schimper!*

2. **K. Quartiniana,** *A. Rich. Fl. Abyss.* i. 311, t. 54. Whole plant glabrous. Stem sulcate, 2–3 ft. high. Leaves obovate or elliptical, crenate, obtuse, 4–7 in. long, petiolate; petioles 1–2 in. long, amplexicaul; bracts entire, linear-ovate, obtuse, slightly amplexicaul. Flowers yellow, in a much-branched somewhat lax trichotomous cyme. Pedicels slender, 1 in. long. Calyx-segments about 5 lines long, slightly spreading, membranous, lanceolate acuminate. Corolla-tube 1–2 in. long; limb 1 in. across, segments obovate, crenate, abruptly acumi-

nate. Squamulæ 2 lines long, linear, obtuse. Anthers of the longer stamens slightly exserted. Carpels as in *K. Schimperiana.*

Nile Land. Abyssinia, *Schimper! Parkyns! Quartin-Dillon.*

Richard describes the corolla-tube as "au moins long de deux pouces;" but in the specimens I have seen and in his figure it does not exceed $1\frac{1}{3}$ inch.

There are in the Kew herbarium imperfect specimens of a plant near this, collected by Plowden in Abyssinia. which is probably new. The corolla-tube is about $\frac{3}{4}$ in. long, and the limb $\frac{2}{3}$ in. across; calyx-segments $\frac{1}{2}$ in. long, acuminate.

3. **K. grandiflora,** *A. Rich. Fl. Abyss.* i. 310. Glabrous. Leaves . . . . Stem terete, glaucescent, cyme trichotomous. Flowers large, purplish. Calyx-segments lanceolate, very acute. Corolla-tube terete, six times as long as the calyx, scarcely inflated at the base, slender above, limb-segments oval-lanceolate, very acute. Squamulæ linear. Carpels oblong acuminate, very narrow.

Nile Land. Abyssinia, *Petit.*

Description from Richard.

4. **K. laciniata,** *DC. Prod.* iii. 395. Stem 3–4 ft. high, glabrous, or (in our specimens) clothed, as well as the inflorescence, with a minute, sparse, crisp pubescence. Lower leaves 3–5 in. long, segments narrow, oblong, acute, coarsely dentate or serrate, upper entire, or nearly so; petioles amplexicaul. Flowers in paniculate cymes; bracts and bracteoles linear, 1–2 lines long. Calyx-segments lanceolate acute, somewhat spreading, 1–2 lines long, glabrous or pubescent; corolla yellow, glabrous, tube $\frac{1}{2}$ in. long; limb-segments acute. Squamulæ linear-lanceolate, entire, 1–2 lines long. Carpels glabrous, $\frac{1}{3}$ in. long; stigmas yellow, often conspicuously persistent.—DC. Pl. Grasses, t. 100; Wight Ic. Pl. Ind. Or. t. 1158.

Lower Guinea. Huilla, Benguela, *Dr. Welwitsch!*

Also in the East Indies and the Mascarene islands.

There are in the Kew herbarium specimens of a *Kalanchoe*, collected by Plowden in Abyssinia, which should probably be referred to this species. In the absence of leaves, however, and the existence of one or two minor differences, I cannot with certainty unite them.

5. **K. brachyloba,** *Welw. mss.* Whole plant glabrous. Root tuberous, tuber subspherical. Stem 2–3 ft. high, cylindrical. Lower leaves broadly sheathing at the base, lanceolate, 3–4 in. long, glaucous, entire or remotely and sparsely denticulate, obtuse. Upper leaves and bracts linear-lanceolate, acute. Flowers yellow, in a broad corymbose spreading many-flowered panicle. Calyx-segments 2–3 lines long, united at the base, deltoid-ovate, obtuse. Corolla-tube $\frac{1}{2}$ in. long, infundibuliform, acutely quadrangular. Limb-segments very short, scarcely spreading, deltoid, acuminate. Carpels narrow, lanceolate, 5 lines long. Squamulæ 2 lines long, linear-lanceolate, obtuse.

Lower Guinea. Benguela, Huilla, *Dr. Welwitsch!*

6. **K. angustifolia,** *A. Rich. Fl. Abyss.* i. 313. Glabrous, caudex thick, creeping; stem erect, slender, 6–10 in. high, glaucescent; leaves opposite, thick, sublinear, subobtuse; flowers small, in a ter-

minal few-flowered cyme. Calyx deciduous, lobes lanceolate, acute. Corolla-tube much inflated at the base, 4-angled, scarcely twice as long as the calyx; limb-segments very long, narrow, lanceolate, very acute, yellow at the margins, brown in the centre. Squamulæ linear. Carpels glabrous, oblong, very acute at the tips.

Nile Land. Abyssinia, Shiré, *Quartin-Dillon.*
Description from Richard.

7. **K. platysepala,** *Welw. mss.* Annual. Stem erect, 1–3 ft. high, pubescent, obscurely tetragonous, subalate. Leaves linear-lanceolate, pubescent, 1–3 in. long, $\frac{1}{3}$ in. broad, entire or rarely slightly sinuate towards the apex, sessile, amplexicaul, subacute, the upper often with short fascicles of flowers in the axils: internodes 2–4 in. long. Inflorescence cymose, loosely pilose. Cymes rounded, compact, terminal, or in larger specimens also lateral, forming an elongated leafy panicle, 1–1$\frac{1}{4}$ ft. long. Calyx subvesicular, lobes broadly ovate, united for about $\frac{1}{3}$ of their length, 2–3 lines long, acute, pubescent, margins ciliolate. Corolla deep yellow, slightly pubescent externally; tube 3–5 lines long, limb 3–5 lines across, segments broadly ovate, glabrous, acuminate. Squamulæ 1–2 lines long, entire. Carpels ovate-lanceolate, 3 lines long, style persistent. Seeds pale-brown, minute.

Lower Guinea. Benguela, Huilla, *Dr. Welwitsch!*
Mozamb. Distr. Shire Valley, Zambesi land, *Dr. Kirk!*

8. **K. Afzeliana,** *Britten.* Plant glabrous, or with a few scattered hairs on the stem. Stems 2–4 ft. high, simple, almost naked above. Root-leaves large, 8 in. or more long, oblong- or rotundate-ovate, obtuse, coarsely crenate or with wide blunt rounded crenate teeth, somewhat cuneate at the base, glaucous beneath, distinctly petiolate. Lower stem-leaves similar to the foregoing but smaller, about 4 in. long, passing abruptly above into narrow obovate-spathulate bracts, distantly toothed above, 1–2 in. long. Flowers in terminal racemose distichous cymes, bright yellow. Calyx-segments ovate-lanceolate, acute or subacute. Tube slender, $\frac{1}{2}$ in. long. Squamulæ whitish, linear-lanceolate, nearly as long as the calyx.—*Vereia crenata*, Andr. Bot. Rep. t. 21.

Upper Guinea. Sierra Leone, *Afzelius!*
I have seen only a cultivated specimen, the type of the figure cited, in Herb. Mus. Brit.

9. **K. glaucescens,** *Britten.* Stem terete, glabrous, occasionally with elongate ascending pubescent branches nearly leafless below, 2 ft. or more in height. Lower leaves narrow-ovate, irregularly crenate, obtuse, glabrous, 5 in. long, narrowed into broadly amplexicaul petioles. Inflorescence glabrous, glaucous. Flowers red or dark-yellow, in compact 2–3-chotomous panicles, or on few-flowered peduncles from the upper nodes. Calyx-lobes glabrous, lanceolate, acute or subacute, somewhat patent, about 2 lines long, united at the base. Corolla-tube $\frac{1}{2}$ in. long, segments short, narrow-ovate acute. Carpels $\frac{1}{3}$ in. long,

glabrous. Squamulæ brown, 2 lines long, subacute. Seeds oblong, dark brown, ½ line long.

Nile Land. Abyssinia, *Schimper!*

10. **K. Welwitschii,** *Britten.* Whole plant glabrous. Stem cylindrical, erect, 3–5 ft. high, nearly an inch thick at the base, glaucous. Radical leaves large, 8–10 in. long, petiolate, ovate or ovate-lanceolate, obtuse, rounded at the base, crenate-dentate or coarsely dentate, teeth purple-margined; petioles 1½–3 in. long. Upper leaves lanceolate or linear-lanceolate, entire or very slightly crenate, the uppermost scarcely petiolate. Bracts lanceolate, subacute. Flowers bright sulphur, in a diffuse corymbose panicle. Calyx-lobes green, broadly lanceolate, long acuminate, ½–⅔ in. long, united at the base. Corolla-tube ¾ in. long, limb ¾–1 in. across, segments ovate, abruptly acuminate and aristate. Squamulæ brown, 3 lines long, entire, membranous at the tip, subacute. Carpels nearly as long as the corolla-tube.

Lower Guinea. Angola, Loanda, *Dr. Welwitsch!*
Also cultivated by the natives.

Var. *gracilituba.* Leaves ovate-lanceolate, smaller than those of *K. Welwitschii;* inflorescence corymbose, branches elongated, subdistichous; tube of corolla 1 in. or more long, much exceeding the carpels. Flowers bright orange-yellow.

Lower Guinea. Angola, Libongo, *Dr. Welwitsch!*

11. **K. crenata,** *Harv. Syn.* 109; *DC. Prod.* iii. 395. Root thick, fibrous. Stem 2–6 ft. high, glabrous throughout or hispidulous in the upper portion. Leaves 2–3 in. long, oblong or roundish ovate or spathulate, coarsely crenate, obtuse, cuneate at the base, glabrous, all but the uppermost distinctly petiolate, petioles 1–1½ in. long; upper leaves sometimes entire. Inflorescence glabrous or hispidulous in trichotomous many-flowered axillary and terminal cymes; peduncles of axillary cymes long, the lowest 6–7 in. in length; internodes 3–6 in. long. Bracts narrow, lanceolate, petiolate; bracteoles setaceous. Calyx-lobes glabrous or hispidulous and viscid, lanceolate, acute, very slightly cohering at the base, 2–3 lines long; pedicels slender, 2–3 lines long. Flowers bright yellow or orange; tube ½ in. long, glabrous or pubescent; limb-segments oblong-lanceolate, acute. Squamulæ linear, 1–1½ lines long. Carpels narrow, 3 lines long.—Harv. Fl. Cap. ii. 379; Don, Gen. Syst. iii. 108. *K. ægyptiaca,* DC. Pl. Grasses, t. 64; Prod. iii. 395; Hook. f. in Journ. Linn. Soc. vii. 192. *K. Petitiana,* A. Rich. Fl. Abyss. i. 311 (ex. descr.). *K. spathulata,* DC. Pl. Grasses, t. 65; Prod. iii. 395. *K. Verea,* Pers. Syn. i. 446. *K. brasiliensis,* Camb. Fl. Bras. Merid. ii. 196. *Cotyledon crenata,* Vent. Jard. Malm. t. 49; Sims, Bot. Mag. t. 1436. *C. Verea,* Jacq. Hort. Schœnbr. t. 435. *C. deficiens,* Forsk. Fl. Ægypt. 89. Of the figures quoted those of DC. and Vent. represent the glabrous form; those of Jacq. and Sims the hispidulous variety.

Upper Guinea. Sierra Leone, *Afzelius! W. Winwood Reade!* Camaroons mountains, 3–7000 ft., *Mann!*

Nile Land. Abyssinia, Yedjou, *Petit.* (*K. Petitiana*, Rich).

Lower Guinea. Angola, Pungo Andongo, sporadically in rocky places and by road-sides, *Dr. Welwitsch!*

Also at the Cape.

The specimens from Sierra Leone and Angola are hispidulous: those from the Camaroons are quite glabrous. I see no grounds for separating from the hispidulous form of this species *K. brasiliensis*, Camb., the only representative of the genus in Tropical America. To the glabrous form I refer *K. ægyptiaca*, DC., of which I have seen no authentic specimens, but which, from the figure in Pl. Grasses, seems to differ from *K. crenata* merely in the dentate leaves, which are described as "crenate-sinuate," and orange flowers (as they appear also in Mann's specimens); *K. Petitiana*, which Richard describes as "very near *K. ægyptiaca* and *K. spathulata*;" and *K. spathulata*, also unknown to me, save from the figure and description in the same work, which may be a distinct species, but agrees with the figure of *K. ægyptiaca*, except that the flowers are bright yellow, and the panicle is looser.

K. ægyptiaca is an Arabian plant, cultivated in Egypt; *K. spathulata* is from China.

12. **K. stenosiphon,** *Britten.* Stems terete, whole plant glabrous, 1–2 ft. high. Leaves entire (only imperfect ones seen). Internodes 2–4 in. long. Panicle elongate, oblong, lax. Peduncles long, ascending, 2–5-flowered; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. or more in length. Calyx-segments somewhat membranous, united at the very base, lanceolate, subacute, about $\frac{1}{4}$ in. long. Corolla-tube $\frac{1}{2}$ in. or more in length, narrow conical, much inflated and truncate below, very slender in the upper portion. Limb-segments narrow, linear-lanceolate, 2 lines long, acuminate. Squamulæ linear-acuminate, 2 lines long. Carpels 4–5 lines long.

Nile Land. Abyssinia, *Schimper!*

13. **K. coccinea,** *Welw. mss.* Stem 2–4 ft. high, glabrous below, more or less hispid above with flaccid glandular hairs. Lower leaves coarsely and irregularly crenate-dentate, glabrous or hairy, ovate, obtuse, petiolate, 3–4 in. long; petioles 1 in. or more in length. Upper leaves linear-lanceolate, scarcely petiolate, subamplexicaul, obtuse. Internodes 4–6 in. long; bracteoles linear, acute, hispid. Inflorescence more or less hispid; flowers scarlet or bright orange, shortly pedicellate, in many-flowered erect or ascending distichous racemes, collected in broad terminal panicles; lower peduncles nearly 1 ft. long, with flowers in rounded corymbose panicles. Calyx pubescent, segments lanceolate, acute, 2–3 lines long, united at the base. Corolla-tube $\frac{1}{2}$ in. long, somewhat membranous, hispid, or sometimes nearly glabrous. Limb $\frac{1}{2}$ in. across, segments deltoid-ovate, acuminate, glabrous or pubescent beneath. Squamulæ linear, whitish, acute, about 2 lines long. Carpels united at the base, adpressed for about half their length. Seeds black or very dark brown.

Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!*

Var. *subsessilis.* Stem hispid, except at the very base. Lower leaves suborbicular upper oblanceolate. Inflorescence densely hispid, with glandular fuliginous hairs. Flowers scarcely pedicellate, in long erect or ascending distinctly unilateral racemes, forming a much-branched, dense terminal panicle, sometimes a foot long.

Lower Guinea. Congo, *Smith!* Perhaps a distinct species.

Mozamb. Distr. Manganya Hills, *Dr. Meller!*

14. **K. brachycalyx,** *A. Rich. Fl. Abyss.* i. 312 (ex descr.). Stem 1–3 ft. high, glabrous below, densely glandular-pubescent above. Leaves 2–4 in. long, obovate-oblong, obtuse, glabrous, coarsely dentate or crenate above, narrowed at the base, shortly petiolate, petioles amplexicaul. Upper leaves lanceolate, or (on barren shoot) obovate-lanceolate, obtuse, nearly entire, often with short fascicles of flowers in their axils. Bracteoles short, linear. Flowers small, yellow, in elongate terminal panicles, with ascending or sometimes divaricate dichotomous branches. Pedicels pubescent, 1–3 lines long, upper flowers almost sessile. Calyx-segments 2–3 lines long, united for about $\frac{1}{4}$ of their length, somewhat spreading when in flower, oblong-lanceolate, acute, ciliate at the margins, glandular-pubescent. Corolla-tube slender, pubescent, $\frac{1}{3}$ in. long or rather more. Limb-segments ovate-obtuse, mucronate, glabrous or slightly pubescent beneath, rather exceeding 1 line in length. Carpels 3 lines long, greenish, not so conspicuously tapering as in the other species. Squamulæ filiform, membranous, 1–2 lines long. Seeds dark brown, linear, very small.—*K. modesta*, Kotsch. et Peyr., ex descr. in Plantæ Tinneanæ, 18. *K. pubescens*, R. Br. in Salt. Abyss. App. (name only).

Upper Guinea. Niger Expedition, *Barter!*
Nile Land. Abyssinia, *Quartin-Dillon. Salt!* Dembo, *Kotschy.*
Mozamb. Distr. Zambesi, *Dr. Möller!* Native name, "N'Kaka."

Although differing in one or two details, I cannot find any characters in the description of *K. modesta* by which to separate it as a species.

15. **K. velutina,** *Welw.* Suffruticose: rhizome thick, fleshy, creeping, emitting barren and flowering shoots; whole plant, including the flowers, shortly and softly pubescent. Lower leaves ovate-lanceolate, sinuate, crenate above, obtuse, 2 in. long, narrowing into short slightly amplexicaul petioles, upper leaves linear-lanceolate, obtuse. Bracteoles short, linear, acute. Inflorescence a terminal rounded panicle; flowers yellow. Calyx adhering to the corolla, segments very short, scarcely a line long, united at the base, deltoid, acute. Corolla circumsciss at the base, tube nearly $\frac{1}{2}$ in. long, scarcely inflated below during flowering; limb-segments short, ascending or slightly spreading, deltoid-ovate, mucronate. Squamulæ small, broad, brown. Carpels dark brown, attenuate.

Lower Guinea. Angola, Pungo Andongo, 3800 ft., *Dr. Welwitsch!*

16. **K. glandulosa,** *Hochst.; A. Rich. Fl. Abyss.* i. 312. Stem 2 ft. high, as well as the inflorescence glandular-pubescent. Radical leaves large, very fleshy, 8–9 in. long, prominently 3-nerved with a scattered glandular pubescence, sometimes almost glabrous, ovate- or obovate-lanceolate, coarsely and very irregularly dentate-crenate, obtuse, tapering to the base, scarcely petiolate; lower stem-leaves obovate, nearly entire, tapering to the base, amplexicaul; upper leaves densely glandular-pubescent, sessile, amplexicaul, lanceolate or oblanceolate, obtuse, with a few wide scattered teeth above, sometimes almost entire. Inflorescence paniculate-cymose; axillary cymes short, 1–2 in. long, the

lowest few-flowered. Bracts and bracteoles short, somewhat deltoid. Calyx subvesicular, usually 4-fid, rarely 4-partite, but distinctly united nearly to the middle; umbilicate at the base, densely glandular-pubescent, 4 lines long; lobes erect, acute or even acuminate, deltoid. Corolla pale yellow, scarcely or slightly exceeding $\frac{1}{2}$ in. long, glabrous at the base, tube slightly pubescent, limb-segments ovate-oblong, acuminate. Squamulæ linear, whitish. Carpels narrow-oblong, glabrous, attenuate.

Nile Land. Abyssinia, *Schimper! Dillon.*
Lower Guinea. Benguela, Huilla, *Dr. Welwitsch!*
In Dr. Welwitsch's specimens the calyx is rather more deeply divided than in the type, and the corolla is somewhat longer. In other respects, however, they correspond.

17. **K. scapigera,** *Welw. mss.* Whole plant glabrous. Stem cylindrical, 1 in. long, transversely rugose with the scars of the fallen leaves. Leaves subrosulate at the summit of the stem, very thick, obovate, obtuse, subpetiolate or nearly orbicular and sessile, of a coppery-yellow in the living plant. Peduncles scapiform rising from the rosette of leaves, solitary or two together, 5–7 in. long, erect, cylindrical, with one or two pairs of opposite deciduous bracts, bearing one or two trichotomous cymes at the summit. Pedicels 1–3 lines long, rigid, bracteoles about $\frac{1}{4}$ line long, thick, lanceolate, almost triquetrous. Flowers bright yellow. Sepals very short, scarcely 1 line in length, deltoid-ovate, rather obtuse, thickened on the back. Corolla-tube not exceeding $\frac{1}{2}$ in. in length, limb-segments ovate, acuminate. Squamulæ linear, 1–2 lines long. Carpels 4–5 lines long, free from the corolla-tube.

Lower Guinea. Benguela, Mossamedes, *Dr. Welwitsch!*
In inflorescence this approaches *K. rotundifolia*, Haw., a Cape species, but that usually has a leafy stem.

18. **K. humilis,** *Britten.* Whole plant glabrous. Rhizome creeping, emitting barren leafy shoots. Scape slender, erect, 3–4 in. long, from a short leafy stock not exceeding 1 in., transversely rugose with the scars of the fallen leaves. Barren shoots about 1 in. long. Leaves spathulate, crenate at the apex, about $\frac{3}{4}$ in. long by $\frac{1}{3}$ in. broad, sessile, or tapering into a short petiole, glaucous, fleshy. Cymes few-flowered, dichotomous, pedicels 2–4 lines long. Calyx-segments deltoid, scarcely $\frac{1}{2}$ line long. Corolla 2 lines long, divided for about one-third of its length, tubular, lobes ascending. Squamulæ minute. Carpels 1–1½ lines long, free from the corolla-tube; styles slender.

Mozamb. Distr. Zambesi land, Moramballa, *Waller!*

Besides the foregoing there are in the Kew Herbarium the following, apparently new and distinct species, represented only by imperfect specimens.

Kalanchoe. Stems glabrous; inflorescence thinly glandular-pubescent; cymes dense; calyx short, 4-partite. *Speke and Grant,* No. 387 (erroneously referred to *K. glandulosa*, in Speke, Trav. App.).

Kalanchoe. Near *K. glandulosa* and *K. brachycalyx;* differing from the former in its 4-partite calyx, and from the latter in its larger flowers. Abyssinia, *Schimper,* 637 (in part).

We have also two specimens, past flowering, and without leaves, of what will pro-

bably prove a new genus, allied to *Kalanchoe*. Inflorescence an erect, spreading, distichous panicle; flowers in unilateral racemes; corolla firm, marcescent, exapiculate. Niger Expedition, *Barter*.

The differences between *Bryophyllum* and *Kalanchoe* seem purely technical.

5. **COTYLEDON,** Linn.; Benth. et Hook. f. Gen. Plant. i. 659.

Calyx 5- rarely 6-partite, equalling or shorter than the corolla-tube. Corolla-tube narrow or wide, urceolate or cylindrical, terete or 5-gonous, limb 5–6-fid, segments usually spreading. Stamens 10–12, inserted on the corolla-tube, filaments filiform, short or elongated; anthers oblong, exserted or included. Squamulæ linear, oblong or square, sometimes broader than long. Carpels 5–6, free, attenuated into filiform or subulate often exserted styles, with obliquely capitellate stigmas; ovules many. Follicles many-seeded.—Herbaceous or shrubby, branched or scapigerous, varying much in habit. Leaves opposite or alternate, sessile or petiolate, often very thick and fleshy, rarely peltate, sparse or rosulate. Flowers erect or pendulous, varying in size, racemose or cymose, often showy. Corolla-lobes twisted in æstivation.

A genus of about 70 species, occurring in West and South Europe, throughout Africa especially at the Cape, in Eastern Asia, the Himalayas, and Mexico.

Flowers 5-merous.
- Inflorescence racemose . . . . . 1. *C. Umbilicus.*
- Inflorescence cymose . . . . . 2. *C. orbiculata.*

Flowers 6-merous . . . . . 3. *C. simensis.*

1. **C. Umbilicus,** *Linn.; Sp. Pl.* 615. Stem erect, simple or branched, glabrous, 2 in. to over a foot high; lower and radical leaves orbicular, fleshy, more or less peltate, concave, crenate or sinuate, glabrous, deep green; bracts entire, often foliaceous, varying from linear to ovate-spathulate, sometimes very small. Inflorescence racemose, usually simple, sometimes with a few short branches; flowers shortly pedicellate, horizontal or subpendulous. Calyx-segments very short, ovate-lanceolate, acute; corolla oblong-ovate, urceolate, somewhat globular, 2–3 lines long, shortly 5-fid, segments acute, not reflexed. Stamens included. Carpels oblong-acuminate.—DC. Pl. Grasses, t. 156. *Umbilicus pendulinus*, DC. Prod. iii. 400. *U. botryoides*, Hochst.; A. Rich. Fl. Abyss. i. 308.

Upper Guinea. Camaroons mountains, 10,000 ft., *Mann!*
Nile Land. Abyssinia, *Schimper! Roth! Dillon.*
Also in Britain, Western Europe, the Canary Isles, and N. W. Africa. In Tropical African specimens the pedicels are shorter and the flowers more globulous than in European examples.

2. **C. orbiculata,** *Linn.; DC. Prod.* iii. 396. Shrubby, 1–2 ft. high. Stem erect or ascending, woody, $\frac{1}{3}$–$\frac{2}{3}$ in. thick, transversely rugose with the scars of fallen leaves, dichotomously branched, branches spreading short, densely leafy. Leaves decussate, opposite, roundish- or oblong-obovate or obovate-spathulate, cuneate at the base, subsessile, fleshy, very thick, glaucous, here and there covered with a white powdery bloom

which easily rubs off, 1–2 in. long. Peduncle scapiform, with two pairs of oblong-lanceolate bracts, one at the base, the other above the middle, glabrous, powdery. Inflorescence a spreading terminal cyme, flowers deflexed, nodding, the lowest pendulous. Calyx not exceeding 2 lines long, lobes deltoid, subacute, glabrous, powdery. Corolla tubular-campanulate, "internally and externally of a bright rose colour"; tube cylindrical, $\frac{1}{2}$–$\frac{2}{3}$ in. long, limb-segments broadly linear, acute, spreading, recurved, nearly as long as the tube. Stamens inserted at the base of the corolla-tube, the 5 alternate with the corolla-lobes being longer than the rest; filaments bearded and broader at the base. Carpels 5, green, conical-cylindrical. Squamulæ short, broadly linear, truncate, emarginate, whitish-yellow.—DC. Pl. Grasses, t. 76; Bot. Mag. t. 32; Harv. Fl. Cap. ii. 371.

Lower Guinea. Benguela, Mossamedes, *Welwitsch!*
Also at the Cape.

3. **C. simensis,** *Britten.* Stem branched from the base, branches spreading, prostrate, almost creeping, thick, 3–5 in. long, naked below, somewhat ascending above, terminating in a rosette of leaves. Leaves narrow spathulate, 1–1$\frac{1}{2}$ in. long, obtuse or subacute, thick ciliate at the margins with cartilaginous teeth, otherwise glabrous. Scape simple, erect, 1–2 in. high, glabrous, bearing 2–7 or more flowers on slender densely glandular-pubescent pedicels. Bracts resembling the leaves but smaller, lanceolate or slightly spathulate. Calyx 6-partite, segments lanceolate, acute, $\frac{1}{4}$ in. long, glandular-pubescent externally. Corolla purplish, tubular-campanulate, segments 6, united for $\frac{1}{3}$ of their length, oblong-lanceolate obtuse, with a reflexed mucro, glabrous or externally slightly pubescent. Stamens 12. Carpels 6, one smaller than the rest, scarcely tapering.—*Sempervivum simense*, Hochst. in Schimp. Hb. Abyss. *Umbilicus semiensis*, J. Gay in A. Rich. Fl. Abyss. i. 308.

Nile Land. Abyssinia, *Schimper!*

6. SEDUM, Linn.; Benth. et Hook. f. Gen. Plant. i. 659.

Calyx 5-partite. Petals 5, free. Stamens 10, perigynous, the alternate ones often adnate to the petals; filaments filiform; anthers didymous. Squamulæ entire or emarginate. Carpels 5, free, narrowed into the style; ovules many. Follicles 5, free, many-seeded.—Glabrous herbs, fleshy, decumbent or cæspitose. Leaves entire, opposite or alternate. **Flowers cymose, yellow.**

A genus of about 130 species, abundant in temperate and frigid regions of the Northern hemisphere, rare in America. The Tropical African species are endemic.

Stems leafy at the base (only?) . . . . . 1. *S. Epidendrum.*
Stems leafy throughout . . . . . 2. *S. Schimperi.*

1. **S. Epidendrum,** *Hochst.; A. Rich Fl. Abyss.* i. 314. Cæspitose, stem "erect" or spreading, much branched, glabrous, thick, somewhat

tetragonous; leaves few, very thick, glabrous, lanceolate or oblanceolate, obtuse, 1–2 in. long, mode of attachment in our specimens uncertain. Flowers erect or ascending, in few-flowered compact rounded cymes, on slender peduncles. Calyx persistent, segments lanceolate, acute, about 1 line long. Petals oblong-lanceolate, acute, spreading, three times as long as the calyx. Carpels oblong, glabrous, acuminate, normally 5 but often fewer by abortion. Squamulæ membranous, linear, truncate, about as long as the calyx.

Nile Land. Abyssinia, upon trees, *Schimper!*
The leaves have almost all fallen away from the specimens I have seen.

2. **S. Schimperi,** *Britten.* Cæspitose; stems spreading, much branched, glabrous, thick, leafy to the inflorescence; leaves opposite, entire, oblanceolate-spathulate, obtuse or rounded at the apex, rather thick, much narrowed below. Flowers in terminal branched rather dense rounded cymes. Calyx-segments deltoid-lanceolate, obtuse, 1 line long. Petals oblong-lanceolate, acute, twice as long as the calyx. Squamulæ linear-lanceolate, as long as the calyx. Carpels as in *S. Epidendrum.*

Nile Land. Abyssinia, *Schimper!*
Much resembles the preceding in the flowers, but the leaves are quite different.

7. **SEMPERVIVUM,** Linn.; Benth. et Hook. f. Gen. Plant. i. 660.

Calyx 6–10-fid or partite. Petals 6–10, lanceolate, free or connate at the base and united with the filaments, acute. Stamens twice as many as the petals, free or united with the petals, filaments filiform or dilated at the base; anthers ovate or didymous. Squamulæ square or linear, dentate or subentire. Carpels as many as the petals, immersed at the base in the calyx-tube, lengthened into slender styles, with capitellate stigmas. Ovules many. Follicles many-seeded.—Herbs or shrubs, thick, fleshy, often acaulescent, emitting leafy branches, or with leafy stems. Leaves alternate, thick, fleshy. Cymes paniculate, often dense. Flowers white or yellow.

An Old World genus, of about 40 species, represented in Central and South Europe, the Canary Isles, Asia Minor, and the Himalayas. The African species are endemic.

Stem thick, suffruticose. Flowers usually 8-merous . . . . . 1. *S. chrysanthum.*
Stem slender, herbaceous. Flowers 10–12-merous.
Whole plant softly villose . . . . . 2. *S. molle.*
Whole plant glabrous . . . . . 3. *S. abyssinicum.*

1. **S. chrysanthum,** *Hochst.* Stem thick, suffruticose, 1–2 ft. high; leaves pectinate-ciliate, on barren shoots rosulate, roundish-ovate; stem-leaves obovate-oblong, rounded above, apiculate. Inflorescence a thyrsoid corymb, peduncles long, glabrous, ascending. Flowers sub-8-merous. Calyx hypocrateriform, with short triangular teeth. Petals yellow, linear-lanceolate. Filaments dilated at the base, united above in a tube with the petals; anthers roundish-ovate. Squamulæ square, with two teeth. Carpels glabrous, erect, immersed at the base in the

calyx-tube.—*Æonium leucoblepharum*, Webb in A. Rich. Fl. Abyss. i. 314.

Nile Land. Abyssinia, *Schimper! Petit.*

I do not see how this differs specifically from *S. arboreum*, L.; but having only dried specimens, do not like to unite them.

S. arboreum, L. (name only) is mentioned in Ferret and Galinier's *Voyage en Abyssinie*, p. 134.

2. **S. molle,** *Vis. Sem. Hort. Patav.* 1841. Biennial, softly villose, with long or short hairs; stem herbaceous, terete, erect, dichotomous, subflexuose. Leaves oval-rhomboid, spreading, with long petioles, spotted with red beneath. Flowers in dichotomous cymes. Petals 10–12, lanceolate, cuspidate, spreading. Squamulæ small, entire or subdentate.—Walp. Rep. ii. 264, 935.

Nile Land. Nubia.

Description from Walpers.

3. **S. abyssinicum,** *Hochst. in A. Rich. Fl. Abyss.* i. 315. Glabrous. Stem erect, about 6 in. high, simple, terete, slender, reddish. Leaves (wanting in our specimen) rather fleshy, opposite, oval obovate or obovate-spathulate, green throughout or spotted with red. Flowers small, white, on long slender pedicels, usually 10-merous, forming a branched lax cyme. Calyx divided below the middle, segments ovate-lanceolate, acute. Petals narrow-lanceolate, acute, 2–3 times as long as the calyx. Carpels short, styles long and slender.

Nile Land. Abyssinia, *Schimper! Petit, Dillon.*

ORDER LI. DROSERACEÆ. (By Prof. Oliver.)

Flowers regular, hermaphrodite. Calyx 5 (4) -partite, or sepals as many, free, imbricate, persistent. Petals 5, hypogynous, free (or connate below), veined, imbricate. Stamens 5 (4–20), hypogynous (or perigynous); filaments free; anthers 2–celled, extrorse. Ovary free (or broadly adnate below), 1 (or 3) -celled, with 3–5 multiovulate placentas (in *Drosera*). Styles 2–5, simple or 2-partite (or multifid). Capsule dehiscing loculicidally, many-seeded. "Embryo straight, in the axis of fleshy albumen."—Herbs, almost invariably glandular-pilose, acaulescent or with prolonged leafy branches. Leaves rosulate or distinctly alternate in the caulescent species, linear spathulate or obovate (rotundate lunate or peltate), stipulate or exstipulate. Flowers fugacious.

A small Natural Order, affecting swampy or sandy stations in tropical and temperate countries of both hemispheres.

1. DROSERA, Linn.; Benth. et Hook. f. Gen. Plant. i. 662.

Stamens 5 (4–8). Styles 3–5, simple or bipartite. Placentas parietal.—Glandular-pilose herbs. Flowers in cymose racemes (or corymbs), white, rose or purple.

A large genus, generally dispersed over the Continents of both hemispheres, but most numerous in Australia.

Acaulescent.
  Leaves rosulate, cuneate-spathulate or rotundate.
    Styles 5 . . . . . 1. *D. Burmanni.*
    Styles 3, each 2-partite . . . . . 2. *D. Burkeana.*
  Leaves linear-spathulate . . . . . 3. *D. affinis.*
Stem elongate leafy. Styles 3, each bipartite.
  Leaves narrow-linear; stipules setiform or 0. Scapes scarcely exceeding leafy shoot . . . . . 4. *D. indica.*
  Leaves oblanceolate or spathulate, petiolate; stipules intra-axillary, fimbriate. Scape elongate.
    Lower leaves reflexed . . . . . 5. *D. ramentacea.*
    Lower leaves ascending . . . . . 6. *D. flexicaulis.*

1. **D. Burmanni,** *Vahl; DC. Prod.* i. 318. Leaves all radical, rosulate, cuneate-spathulate, lamina equalling or exceeding the broad petiole. Stipules connate intra-axillary scarious fimbriate, half as long as petiole. Scape and pedicels glabrous; pedicels secund, about equalling the papillose fruiting calyx. Styles 5, undivided, slender; stigmas radiate-papillose. Placentas 5.

Upper Guinea. Sierra Leone, *Afzelius.*
Description from M. Planchon's memoir.
Also in Tropical Asia and Australia.

2. **D. Burkeana,** *Planch. in Ann. Sc. Nat. sér.* 3, ix. 192 Acaulescent. Leaves more or less compactly rosulate, obovate or rotundate-cuneate, upper surface especially towards the margin clothed with stipitate glands; lamina $\frac{1}{6}$–$\frac{1}{4}$ in. broad, petiole pubescent or glabrate, $\frac{1}{6}$–$\frac{1}{2}$ in. Stipules membranous, intrapetiolar, cut into about 3–5 or more teeth. Scape erect with the inflorescence glandular-puberulous, 2–3 in. to 1 ft., few- to many-flowered. Pedicels nearly equalling the calyx. Flowers purple. Styles 3, each bipartite, branches slender, simple or bidentate at apex.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Also south of the Tropic.

3. **D. affinis,** *Welw. sp. nov.* Acaulescent. Leaves tufted, erect, on long slender glabrous petioles, lamina linear-spathulate, obtuse, gradually narrowed from near the apex downwards, clothed with spreading stipitate glands to the petiole, together with it 2–3½ in. long, lamina 1–2 lines broad above. Stipules more or less laciniate. Scape erect, glabrous, 2–3 times longer than leaves. Pedicels shorter than the puberulous ciliolate lobed calyx; bracts 1 line more or less, linear. Petals blue-purple. Styles 3, each divided to the base into two slender branches equalling or exceeding the ovary.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Near to *D. capensis*, in which, however, the leaf-lamina is uniformly linear or even slightly narrowed towards the apex.

4. **D. indica,** *Linn.; DC. Prod.* i. 319. Stems elongate, ascending, leafy. Leaves narrow-linear, attenuate above, upper surface clothed

with long, slender, stipitate glands nearly to the base; ¾–1½ in. long. Stipules setiform or obsolete. Racemes very shortly pedunculate, shorter than or scarcely overtopping the leafy shoots, at length often recurved. Bracts subulate. Pedicels ¼ in. more or less. Sepals linear-lanceolate, acute. Petals spathulate, gradually narrowed below. Styles 3, bipartite to base, segments filiform, laxly papillose at apex.—*D. minor*, Schum. et Thonn. Pl. Guin. 167.

Upper Guinea. Nupe, Niger, *Barter!* Sierra Leone, *Afzelius.*
Lower Guinea. Pungo Andongo, Angola, *Dr. Welwitsch!*
Also Indian and eastward to China and Australia.

5. **D. ramentacea,** *Burch.; DC. Prod.* i. 318. Stems ascending, elongate, leafy, lower withered leaves sharply reflexed. Leaves of present year spreading or erect, oblanceolate, obtuse, clothed with long red glands on the upper surface, narrowed into long, straight, slender, nearly glabrous petioles; with the petiole ¾–1 in. long. Stipules connate, intra-axillary, scarious, narrow-laciniate. Scapes long, slender, glabrous or crisped-puberulous, abruptly curved at base, simple or forked above, ⅔–1 ft. long; racemes 4–15-flowered. Bracts linear-oblong, obtuse, shorter than or equalling the pedicels which are 1–3 lines. Sepals oblanceolate or obovate-oblong, ciliate, with the pedicels obsoletely glandular-granulate. Petals obovate. Styles 3, each divided to the base, segments linear-subulate, minutely papillose.—*D. madagascariensis*, DC. l.c.

Upper Guinea. Nupe, Niger (scape glabrous), *Barter!*
Lower Guinea. Huilla, Angola (scape puberulous), *Dr. Welwitsch!*
Also at the Cape, and in Madagascar.

6. **D. flexicaulis,** *Welw. sp. nov.* Stem erect, slender, flexuous, sparsely leafy, glabrate, 3–8 in. long from fascicled, elongate, cylindrical tubercles. Leaves spathulate-oval, with stipitate glands, narrowed into the slender, glabrous petiole, all, including the lower, erect or ascending; lamina and petiole 1–1½ in. long. Stipules of rosette-leaves unequally setaceous-multifid. Scapes 1 or 2, erect, very slender, usually curved at base from a little below the extremity, glabrous, 4–7 in. long. Pedicels strict-erect, about equalling the calyx; bracts filiform, deciduous. Calyx-lobes ciliolate. Styles as in *D. ramentacea.*

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Stem-leaves never reflexed as in *D. ramentacea.*

Order LII. HAMAMELIDEÆ. (By Prof. Oliver.)

Flowers unisexual (or hermaphrodite). Perianth 0 (or calyx-tube more or less adnate with the ovary). Petals 0, 4 or more. Stamens 4–∞; filaments short or long, free; anthers oblong, often tetragonous, 2-celled, dehiscing longitudinally, sometimes by a valve on each side. Ovary 2–3–4-carpellary, 2–4-celled below, when calyx is present usually partially or wholly inferior; carpels free above, each with a subu-

late, longitudinally stigmatose style (or stigmas terminal). Ovules (solitary or) indefinite; placentation axile. Fruit a capsule. Seeds albuminous.—Trees or shrubs. Leaves alternate or opposite, stipulate. Flowers capitate spicate or racemose.

A small Natural Order, widely spread, but absent from South America, Europe, and Australia. One genus is peculiar to the Cape, another to Madagascar, and *Myrothamnus*, the only representative in Tropical Africa, occurs also in Madagascar and at the Cape.

1. **MYROTHAMNUS**, Welw.; Benth. et Hook. f. Gen. Plant. i. 1005.

Flowers dicœcious, achlamydeous, spicate. Male flowers: Stamens 4–8; filaments short or elongate, free; anthers oblong, tetragonous or obovate-cuneate, 2-celled, basifixed, dehiscing longitudinally; connective shortly produced at the apex. Female flowers: Ovary 3–4-carpellary, 3–4-gonous, 3–4-celled below, with ∞ ovules on an axile placenta, carpels free above, longitudinally stigmatose on the inner face. Capsule coriaceous, in *M. flabellifolia* dehiscing above by the ventral sutures of the free apices of the carpels; many-seeded. Seeds (in same species) "minute, ovoid, with copious fleshy albumen."—Shrubs from 1 or 2 to 6 or 8 ft.; wholly glabrous, abounding in a balsamic resin, rigid, erect, with strict opposite branches. Leaves opposite, subsessile, flabellate-cuneiform, crenate-dentate, plicate-nerved (or linear denticulate at apex). Stipules minute, subulate. Spikes erect, cylindrical, terminal.

But two species are known—the following and another, *Myosurandra moschata*, Baill. in Adansonia, ix. t. 8, peculiar to Madagascar.

1. **M. flabellifolia,** *Welw. Apont. Phytog. Angol.* Shrub varying from 1–7 ft., extremities early woody, tetragonous, bark fissuring longitudinally. Leaves $\frac{1}{3}$–$\frac{1}{2}$ in. long more or less, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, toothed, during the dry season closely plicate. Bracts broadly ovate. Stamens 4–8 (5); anthers subsessile. Ovary 3-celled, carpels connate halfway.—Linn. Trans. xxvii. 23. t. 8. *Cliffortia? flabellifolia*, Sond. Fl. Cap. ii. 597.

Lower Guinea. Pungo Andongo, 3–4000 ft., and Huilla, 5–5500 ft., Angola, *Dr. Welwitsch!*

Mozamb. Distr. "The Boss," 4000 ft., Mgunda-Mkhali, *Speke and Grant!*

Also at the Cape.

M. Baillon's plant differs in its tetramerous pistil, and in the presence of a pair of lateral bracteoles to each flower, but it is doubtless a congener.

ORDER LIII. **HALORAGEÆ.** (By Prof. Oliver.)

Flowers small or minute, hermaphrodite or unisexual, di- mono- or achlamydeous. Calyx-tube adnate to the ovary, limb toothed or 0; or calyx wanting. Petals 2–4 or wanting. Stamens 1–2–4–8; anthers basifixed, 2-celled, dehiscing longitudinally. Ovary 1- or 4-celled (in African genera). Ovules solitary (or 4 in *Serpicula*), pendulous; styles

various, stigma papillose or plumose. Fruit small, a nut or drupaceous. Seed with a fleshy albumen.—Herbs (or undershrubs), often aquatic. Leaves radical or cauline, opposite or alternate, usually exstipulate. Flowers axillary, solitary or fascicled, or in paniculate spikes.

A small Natural Order, generally distributed over the Globe.

Flowers axillary, fascicled. Stamens 4–8. Ovary inferior, 1-celled, 4-ovuled . . . . . 1. SERPICULA.
Flowers in spiciform panicled spikes. Stamens 2–1. Ovary inferior, 1-celled, 1-ovuled . . . . . 2. GUNNERA.
Flowers axillary, solitary, achlamydeous. Stamen 1. Ovary 4-lobed, 4-celled . . . . . 3. CALLITRICHE.

1. **SERPICULA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 675.

Flowers minute in axillary fascicles, monœcious or polygamous. Male flowers: Calyx-tube short, lobes 4. Petals 4, linear or oblanceolate, concave above. Stamens 8 or 4; filaments short or 0; anthers linear, basifixed. Female flowers: Calyx-tube ovoid, 8-ribbed, or with 8 rows of 3 or 4 tubercles, sometimes confluent, to each; teeth 4, ovate or deltoid. Petals as in male. Ovary 1-celled with 4 pendulous ovules; stigmas 4, papillose. Nut minute, 1-seeded, crustaceous. Seed albuminous.—Low herbs, glabrous or pubescent. Leaves opposite or alternate, simple. Male flowers in some species on slender pedicels; female sessile or subsessile.

A small genus of 2–4 species, wide-spread in the Tropics.

1. **S. repens,** *Linn.; DC. Prod.* iii. 65. *var.* Stems creeping, often rooting at intervals, minutely hirsute puberulous or glabrate. Leaves alternate, linear or narrow-oval, rather obtuse, entire or obsoletely denticulate, glabrous, $\frac{1}{2}$ in. long more or less, $\frac{1}{15}$–$\frac{1}{20}$ in. broad. Flowers minute, sessile or subsessile, fascicled in the axils. Calyx-teeth of fertile flower minute, triangular. Petals narrow-oval, narrowed to base, equalling or exceeding the calyx-tube. Stamens 4; anthers oblong, subsessile or filiform, filaments very short. Nuts with 8 rows of tubercles, 3 or 4 in each row.

Upper Guinea. Nupe, Niger, *Barter!*
Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
Some of the specimens cited correspond with *S. brasiliensis*, Camb. (Fl. Bras. Merid. ii. 250), which I can only regard as a variety of *S. repens*.
Grows also at the Cape.

2. **GUNNERA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 676.

Flowers monœcious or polygamous, minute, spicate; spikes in spiciform panicles. Calyx-lobes small, 2 or more; tube in fertile flowers adnate to the ovary. Petals 0 or 1–2. Stamens 2 or 1; anthers ellipsoidal, basifixed, subsessile or filaments distinct. Ovary inferior 1-celled, with a solitary, pendulous ovule; styles 2, subulate, uniformly papillose. Fruit a small nut or drupaceous with a crustaceous

putamen.—Scapigerous herbs. Leaves radical, petiolate, reniform cordate or ovate, often rugose. Staminate flowers crowded towards the extremity of the inflorescence.

A small genus, very local but widely spread, especially in the Southern hemisphere.

1. **G. perpensa,** *Linn.*; *DC. Prod.* xvi. 2, 598. Leaves rotundate-reniform with a deep basal sinus dilated at the insertion, the lobes rounded and overlapping the petiole below, unequally crenate-dentate, shortly appressed-hirsute on both surfaces, about 6 in. in diameter in our only specimen, the sinus about 2–2½ in. deep; petiole 10 in. or more. Panicle 20–24 in., spiciform, branches slender, successively shorter from below, erect, the lower compound. Calyx-teeth of pistillate flowers 2, fleshy, triangular, opposite; of the staminate flowers variously deformed, 1–4–toothed. Petal when present linear. Anthers 2 or 1 subsessile.—Bot. Mag. 2376.

Nile Land. Abyssinia, *Dr. Roth!*
Also at the Cape and Natal.

3. **CALLITRICHE,** Linn.; Benth. et Hook. f. Gen. Plant. i. 676.

Flowers minute, axillary, solitary, achlamydeous, unisexual. Male flower: Stamen 1, often bibracteolate, filaments filiform; anthers as broad as long. Ovary 4-lobed, 4-celled, ovules solitary; styles 2, subulate or filiform. Fruit 4-lobed, 4-seeded, small, indehiscent.—Glabrous herbs, aquatic or limnophilous; stems often elongate, slender. Leaves opposite, entire, linear or spathulate.

A small cosmopolitan genus.

1. **C. stagnalis,** *Scop.*; *Hegelmaier, Monog. Callitriche,* 58. Leaves obovate- or oblanceolate-spathulate, when growing in water the upper usually forming a rosette. Fruit sessile or subsessile, nearly orbicular, compressed tetraquetrous, the margins distinctly narrowly winged (stigmas persistent, *Hegel.* l. c.).

Nile Land. Abyssinia, *Schimper.*
Widely spread in the Old World. I have not myself seen Abyssinian specimens.

Order LIV. RHIZOPHORACEÆ. (By Prof. Oliver.)

Flowers usually hermaphrodite, regular. Calyx more or less adherent to the ovary or free, limb 4–14-toothed -lobed or -partite; lobes valvate, usually coriaceous and persistent. Petals as many as calyx-lobes, perigynous or subhypogynous, apex frequently 2–∞ -fid, margins often conduplicate. Stamens 2-4 times as many as petals, epi- peri- or subhypogynous, inserted below or upon the margin of the disk; filaments free, various; anthers 2-celled, dehiscing longitudinally (multilocellate in *Rhizophora*). Ovary more or less adherent or free, 2–5-celled or dissepiments partially suppressed. Ovules geminate, collateral, pendulous (or solitary in *Anisophyllea*); style 1 simple (or 4 in

Anisophyllea); stigma simple or lobed. Fruit coriaceous, 1-celled, 1-seeded, indehiscent, or 3–4-celled with 1–2 seeds in each cell, and septicidally dehiscent. Seed albuminous or exalbuminous, in the latter the cotyledons minute; in *Rhizophoreæ* germinating in the still attached fruit, the apex of which is perforated by the elongating pendulous radicle.—Trees or shrubs mostly affecting littoral situations; usually glabrous. Leaves opposite, stipulate (alternate, exstipulate in *Anisophyllea*). Flowers axillary, solitary, cymose or glomerate, sessile or pedicellate, with or without sheathing bracteoles at base.

A rather small Tropical Order, common to the shores of both hemispheres. Two genera are peculiar to Africa and its Islands; one of these to Madagascar.

Leaves opposite, stipulate. Ovary inferior or ½-inferior. Style 1. Seed germinating in the pericarp, exalbuminous (*Rhizophoreæ*).	
Calyx 4-merous. Petals entire. Anthers ∞-locellate, subsessile	1. RHIZOPHORA.
Calyx 5–6-merous. Petals truncate or bifid with apical setæ. Anthers 2-celled, filaments filiform	2. CERIOPS.
Calyx 8–14-merous. Petals bifid, with apical setæ. Anthers 2-celled, filaments filiform	3. BRUGUIERA.
Leaves opposite, stipulate. Ovary superior (or inferior). Style 1. Seed albuminous.	
Calyx 4–5-fid or -partite	4. WEIHEA.
Calyx campanulate, 4–5-toothed	5. DACTYLOPETALUM.
Leaves alternate. Ovary inferior. Styles 4–3 (*Anisophylleæ*)	6. ANISOPHYLLEA.

1. **RHIZOPHORA,** Linn.; Benth. et Hook. f. Gen Plant. i. 678.

Flowers very coriaceous. Calyx-tube very short, sheathed by confluent bracts, limb 4-partite, lobes lanceolate or oblong coriaceous valvate. Petals 4, entire, margins not meeting in bud. Stamens 8 (–12), perigynous; filaments very short or 0; anthers erect, elongate, triangular in section, 2 inner faces multilocellate, pollen liberated by separation of a common indusium. Ovary inferior or nearly so, 2-celled; ovules geminate pendulous; style more or less thickened below, 2-dentate at stigmatic apex. Fruit coriaceous, ovoid or obconic, 1-celled, 1-seeded. Seed exalbuminous; cotyledons conferruminate; germination taking place in the fruit, the radicle at length much exserted (1 ft. or more), terete or nearly so, at length rooting in the mud.—Trees; extremities stout, marked with annular scars. Leaves opposite, petiolate, entire, very coriaceous, glabrous. Stipules interpetiolar, elongate, caducous. Cymes axillary, pedunculate, 2–3-chotomous, few- or many-flowered.

A small genus, common on intertropical shores.

Leaves elliptical or obovate-elliptical, with a distinct mucro. Peduncles few-flowered	1. *R. mucronata.*
Leaves elliptical obtuse, not mucronate. Peduncles few-flowered	2. *R. Mangle.*
Leaves narrow-elliptical or oblanceolate. Peduncles many-flowered	3. *R. racemosa.*

1. **R. mucronata,** *Lam.*; *DC. Prod.* iii. 32. Leaves elliptical or obovate-elliptical, broadly pointed or obtuse, with a distinct apical

mucro or narrow apiculus, broadly cuneate or slightly rounded at base, scarcely or not at all narrowed into the petiole, midrib very prominent beneath, attenuate upwards, dull greenish yellow beneath when fresh; usually 3–4½ in. long, 1¾–2¾ in. broad; petiole ¾–1¼ in. Peduncles axillary, compressed, often recurved, 1 in. more or less, few-flowered. Flowers nearly as in *R. racemosa*, probably rather larger and stouter. Style conical below. Fruit elongate-ovoid.

Mozamb. Distr. Luabo mouth of Zambesi, *Dr. Kirk!* From Quirimba to Inhambane, 11° to 24° S. lat., *Dr. Peters.*

Also South of the Tropic, in Mascarene Islands, India and eastward to Australia and Polynesia.

Description partly from a drawing by Dr. Kirk, from fresh specimens. A. Richard (Fl. Abyss. i. 271), cites *Rhizophora Candelaria*, DC., as occurring by the Red Sea, near Massouah. I have not seen a specimen.

2. **R. Mangle,** *Linn.*; *DC. Prod.* iii. 32. Leaves elliptical, obtuse, curvature in circumscription nearly equal from about the middle of the blade to each extremity, somewhat narrowed into the petiole at the base, 3–4 in. long, 1½–2 in. broad more or less; petiole ½–¾ in. Peduncles axillary, ½–1½ in., ascending or decurved, often compressed, few-flowered; pedicels about 3, ⅙–¾ in. long. Flowers and fruit nearly as in *R. mucronata.*

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Brunner!*

Widely spread in Tropical America. Our specimens are unsatisfactory, and I do not feel great confidence in this identification.

3. **R. racemosa,** *G. F. W. Meyer*; *DC. Prod.* iii. 32. A small tree. Leaves oblanceolate-elliptical or oval, equally narrowed from the middle or a little above the middle to each end or more gradually to the base, narrowing into the petiole, apex broadly pointed, becoming shortly revolute on drying; lamina 3½–6 in. long, 1¼–2¼ in. broad; petiole ½–¾ in. Flowers in pedunculate divaricate shortly-jointed many-flowered cymes from the lower axils of the terminal leaf-tufts. Peduncles somewhat or slightly compressed, often decurved, 1–2 in. long. Pedicels and joints of cyme ¼ in. more or less, with small confluent bracteoles at the articulations. Calyx-lobes about 5 lines long. Petals narrow-oval with lax marginal hairs. Style rather slender, slightly thickened below. Fruit 1½ in. long, oblong-ovoid, terete.

Upper Guinea. Sierra Leone and Grand Bassa, *E. Vogel!* Brass, *Barter!*

Also in Tropical America, if this identification be correct. The "Red Mangrove" of the Brass traders (*Barter*). Perhaps to this species belongs a fragmentary specimen from the Congo (*Smith*), in the Kew herbarium; the plant no doubt referred to by R. Brown in Tuckey, App. 437.

2. **CERIOPS,** Arn.; Benth. et Hook. f. Gen. Plant. i. 679.

Flowers very coriaceous. Calyx-tube short, sheathed by confluent bracteoles, limb 5–6-partite, segments oblong-lanceolate, coriaceous, valvate. Petals 5–6, truncate or emarginate with 3 or more apical glands or clavate setæ, membranous with a median nervure. Stamens 10 or 12, inserted in the lobed disk; filaments slender, much exceeding

the rather small ovate-oblong or oblong 2-celled longitudinally dehiscing anther. Ovary ½-inferior, "3-celled" or with the dissepiments partial or reduced to slender cords; ovules 2 in each cell; style undivided, thickened at base. Fruit and germination as in *Rhizophora;* the protruded radicle usually strongly sulcate towards the apex, at least when dry.—Trees or large bushes, wholly glabrous. Leaves opposite, coriaceous, entire, petiolate. Stipules interpetiolar, caducous. Peduncles axillary, shortly or obsoletely 3–2-chotomous at apex; flowers smaller than in *Rhizophora*, subcapitate.

A small genus, widely spread along muddy intertropical shores in the Old World.

1. **C. Candolliana,** *Arn. in Ann. Nat. Hist.* i. (1838), 364. Bush or small tree. Branches smooth, terete, or extremities slightly compressed. Leaves obovate-elliptical or elliptical, apex rounded often slightly emarginate, base narrowed into the petiole, midrib rather prominent beneath, venation obscure; 1½–3½ in. long, ¾–2 in. broad; petiole ½–1½ in. Peduncles usually considerably under 1 in., bracteolate and very shortly or obsoletely 2–3-forked at apex. Flowers subsessile or pedicels very short. Petals 5, oblong truncate with 3 apical clavate setæ, base very shortly abruptly narrowed, slightly coherent for a short space by the margin a little below the middle. Stamens 10, alternately shorter.—*C. mossambicensis,* Klotzsch in Peters' Mossamb. Bot. 71. (See Arnott's memoir for further synonymy.)

Mozamb. Distr. Mouth of Zambesi, *Dr. Kirk!* From Querimba to Mozambique, *Dr. Peters.*

Through some blunder, Dr. Klotzsch (l. c.) describes the style as growing out to 9 in. in length with the maturing of the fruit, mistaking for it the protruded radicle.

Occurs in India and eastward to Australia.

3. **BRUGUIERA,** Lam.; Benth. et Hook. f. Gen. Plant, i. 679.

Flowers coriaceous. Calyx ebracteolate; tube obconical, produced above the inferior ovary, limb 8–14-partite, segments linear or subulate valvate. Petals as many as calyx-segments, inserted in mouth of calyx-tube, bifid, with a median and lateral apical seta, margins conduplicate below. Stamens twice as many as petals in pairs opposite to and embraced by them; filaments filiform; anthers linear, 2-celled, mucronate. Ovary inferior, 2–3–4-celled; style filiform, with as many minute stigmatic teeth as cells in ovary; ovules geminate. Fruit turbinate, very coriaceous, crowned by the persistent free portion of the calyx-tube; 1-celled, 1-seeded. Cotyledons minute (bipartite in following species, *Dr. Kirk*); radicle protruded from the pericarp, elongate, clavate, ultimately rooting.—Trees, wholly glabrous. Leaves opposite, petiolate, elliptical, entire, coriaceous. Stipules interpetiolar, caducous. Peduncles axillary, usually decurved, 1–∞-flowered.

A small genus of muddy intertropical shores in the Old World.

1. **B. cylindrica,** *Blum. Mus. Lugd.-Bat.* i. 137. (*var.*) Tree of considerable size. Leaves rather narrowly elliptical, acute or subacute or

shortly acuminate, narrowed and subcuneate at base, midrib very prominent beneath; 3–4½ in. long, 1½–2¼ in. broad; petiole ¾–1½ in. Peduncles decurved, 1-flowered, shorter than the petioles. Flowers about 1 in. long. Calyx-limb with about 11 narrow coriaceous linear acute segments; tube costate above. Petals ⅔–¾ length of calyx, oblong, rather coriaceous, lobed ¼–⅓ from apex, with a median seta and 1 obliquely from each rather obtuse mucronate lobe, hirsute-pilose below, especially towards the margins. Ovary 3-celled. Germinating radicle I have not seen.—Probably not specifically distinct from *B. gymnorrhiza*, Lam. and *B. capensis*, Blum. l. c.

Mozamb. Distr. Luabo and Kongone mouth of Zambesi, *Dr. Kirk!* whose specimens are accompanied by a careful drawing. He describes it as the commonest and most handsome of the Zambesi Mangroves, littoral, but extending farther inland than the rest.

Also South of the Tropic, and around the Indian Ocean. Dr. Sonder (Fl. Cap. ii. 514), reduces *B. capensis*, *Wightii*, and *Rheedii*, Bl., to *B. gymnorrhiza;* perhaps rightly.

4. **WEIHEA,** Spreng.; Benth. et Hook. f. Gen. Plant. i. 681.

Calyx 4–5-fid or -partite, with a minute or obsolete bracteolar cupule at the base or base of very short pedicel; tube campanulate turbinate or very short, lobes valvate, spreading. Petals as many as calyx-lobes, subhypogynous, spathulate, lamina laciniate. Stamens 10–20–30, subhypogynous, 1-seriate or nearly so; filaments free, filiform; anthers oblong or linear, dehiscing longitudinally. Ovary free, globose or ovoid, 3–5-sulcate or -lobed, 3–(5)-celled; style distinct; stigma subcapitate, lobulate. Ovules geminate, early arillate. Fruit globose, fleshy or coriaceous, dehiscing septicidally in as many valves as carpels. Seeds arillate; "embryo straight with flat cotyledons in a fleshy albumen."—Trees or shrubs; glabrous or buds and innovations pubescent. Leaves opposite, elliptical, entire or serrate, rather coriaceous. Stipules interpetiolar, oblong or lanceolate, deciduous. Flowers axillary, solitary or fascicled, sessile or very shortly pedicellate.

A small genus, confined to Africa, the Mascarene Islands, and Ceylon.

Leaves rounded or broadly and obtusely pointed. Flowers 5-merous.
  Stamens about 20. Ovary glabrate . . . . . 1. *W. africana.*
Leaves distinctly acuminate.
  Flowers 4-merous. Petals plumose. Stamens 28–30. Ovary hirsute . . . . . 2. *W. plumosa.*
  Flowers 5-merous. Stamens 10. Ovary hirsute . . . . . 3. *W. Afzelii.*

1. **W. africana,** *Benth.* Shrub or small tree, glabrous or the young internodes and leaf- and flower-buds sparsely pubescent or puberulous. Leaves coriaceous, from broadly to narrowly elliptical or oblanceolate, apex rounded entire or emarginate or obtusely pointed, more or less rounded or subcuneate at base, dentate-serrate or -serrulate excepting towards the base, though sometimes obsoletely; midrib and reticulation rather prominent; 1½–3½ in. long, ⅔–2¼ in. broad; petiole 1–3 lines. Flowers axillary, sessile or subsessile, solitary or in fascicles

of 2–3, $\frac{1}{3}$–$\frac{1}{2}$ in. diameter. Calyx deeply 5-fid or at first sub-5-partite, lobes lanceolate or oblong-lanceolate. Petals oblanceolate, narrowed to the base, multifid-laciniate above. Stamens 20 or thereabout, subhypogynous, free; filaments filiform, anthers linear. Ovary depressed-globose, glabrous, 3-celled; style persistent, stigma subcapitate. Fruit opening in 3 coriaceous valves exceeding the persistent calyx-lobes.—*Cassipourea africana*, Benth. Fl. Nigrit. 341; *Anstrutheria*, Benth. in Journ. Linn. Soc. iii. 78.

Upper Guinea. Senegambia, *Bidjem!* Quorra, *Dr. T. Vogel!* Nupe, *Barter!* (A form with smaller oblanceolate leaves.)

Cassipourea congensis, R. Br., DC. Prod. iii. 34, may be the same plant, as suggested in "Fl. Nigrit." 342, and the same or a very near ally grows at Natal (*Gerrard*, 1655).

2. **W. plumosa,** *Oliv.* Tree of 30 ft.; terete branches and foliage glabrous. Leaves thinly coriaceous, elliptical or oblong-elliptical, narrowed into a distinct rather obtuse acumen $\frac{1}{3}$–$\frac{3}{4}$ in. long, base slightly rounded or cuneate, obsoletely undulate-crenate above; 2–3$\frac{1}{2}$ in. long without the acumen, 1$\frac{1}{4}$ to nearly 2 in. broad; petiole $\frac{1}{6}$ in. Flowers sessile or subsessile in axillary fascicles of about 3–5 or solitary. Bracteoles very minute. Calyx glabrous externally, 4-fid, campanulate, lobes ovate, appressed setose-hirsute within. Petals considerably exserted, elongate-spathulate with slender claw, lamina closely fringed, laciniæ plumose. Stamens 1-seriate, subhypogynous, about 28–30; filaments filiform, anthers oblong-elliptical. Ovary sheathed by free calyx-tube, densely setose-hirsute; style appressed, hispid, rather stout, much exceeding the ovary; stigma 2-lobulate. Fruit . . . .

Upper Guinea. River Kongui, *Mann!*

3. **W. Afzelii,** *Oliv.* Terete extremities and foliage glabrous. Leaves thinly coriaceous, elliptical or oblong-elliptical, shortly but distinctly obtusely acuminate, rounded or cuneate at base, obscurely serrate towards the apex; with acumen 3–5 in. long, 1$\frac{1}{2}$–2 in. broad; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. Flowers sessile or subsessile in axillary fascicles of 2 or 3 or solitary; bracteoles microscopic. Calyx glabrous outside, appressed-hispid within, deeply 5-fid, lobes erect, ovate-lanceolate. Petals exserted as in *W. plumosa*. Stamens 10, 5 being opposite to the petals, subhypogynous. Ovary setose-hirsute, 3-celled, wholly free.

Upper Guinea. Sierra Leone, *Afzelius!*

Closely resembling *W. plumosa*, differing in the number of stamens, &c.

5. DACTYLOPETALUM, Benth.; Benth. et Hook. f. Gen. Plant. i. 682.

Calyx campanulate or suburceolate, shortly 4–5-toothed, tube ebracteolate. Petals 4–6, inserted at base of calyx-tube outside a cupuliform or sheathing disk, linear or spathulate, apex laciniate, exceeding the calyx. Stamens 8–10 (–15), inserted on margin of the disk-tube; filaments filiform; anthers oblong or linear. Ovary free, globose, pubescent or glabrous, 2–3-celled or cells confluent above; ovules geminate,

pendulous. Fruit not observed.—Trees or shrubs; glabrous. Leaves opposite, petiolate, elliptical, undulate-crenate or entire, coriaceous. Stipules interpetiolar, caducous. Flowers small, numerous, in dense axillary fascicles or glomerules or from the nodes of previous years.

A small genus, restricted to Africa and the Mascarene group.

Calyx 5-toothed. Stamens 10. Ovary pubescent . . . . . 1. *D. Barteri.*
Calyx 4-toothed. Stamens 8. Ovary glabrous . . . . . 2. *D. Mannii.*

1. **D. Barteri,** *Hook. f. mss. in Herb. Kew.* Shrub or small tree; wholly glabrous. Branches terete with thickened floriferous nodes. Leaves coriaceous, broadly elliptical, rounded above or shortly broadly and obtusely apiculate, rounded often broadly at base, entire, reticulation more or less obvious above and below; 4–7 in. long, 2–3½ in. broad; petiole ¼ in. more or less. Flowers numerous, small, in dense subglobose fascicles on the thickened nodes chiefly below the leaves of the present year, subsessile or pedicels about 1–2 lines. Calyx campanulate, shortly 5-deltoid-dentate, 1–1½ lines long. Petals about twice as long as calyx, linear-spathulate, apex fimbriate-laciniate. Stamens 10, inserted upon a short sheath-like disk within the petals; anthers elliptic-oblong. Ovary hairy, 2-celled; stigma capitate, subentire.

Upper Guinea. Nun river, *Barter!* Gaboon, *Mann!*

2. **D. Mannii,** *Hook. f. mss. in Herb. Kew.* Tree of 25 ft., wholly glabrous. Branches terete, the nodes hardly thickened, young extremities slightly compressed. Leaves oblong or ovate-elliptical or elliptical, probably obtuse or obtusely apiculate, but apex eroded in our specimens, base rounded, undulate-crenate, coriaceous, reticulation not prominent, 2½–3½ in. long, 1⅓–2 in. broad; petiole ¼–½ in. Flowers numerous in rather close glomerules on the nodes of previous year, pedicels 1–1½ lines, articulate. Calyx campanulate-urceolate with 4 short triangular teeth. Petals about ½ as long again as calyx, linear, slightly dilated and fimbriate at apex. Stamens 8, inserted as in *D. Barteri*; anthers oblong. Ovary glabrous, 2–(3)-celled, the cells apparently confluent at the apex.

Upper Guinea. St. Thomas Island, summit of the Peak, *Mann!*

6. **ANISOPHYLLEA,** R. Br.; Benth. et Hook. f. Gen. Plant. i. 683.

Flowers small, hermaphrodite or unisexual by abortion. Calyx-tube adnate to ovary, ovoid, limb 4-partite with erect valvate lobes. Petals as many as calyx-lobes, equalling or scarcely exceeding them, apex lobed or laciniate (or entire). Stamens 8, inserted with the petals; filaments subulate or narrow-linear; anthers small, ellipsoidal, dorsifixed. Ovary inferior, 4-celled; styles 4, short, subulate, dilated at base into epigynous disk; ovules solitary, pendulous. Fruit "indehiscent, 1-celled, 1-seeded. Embryo exalbuminous, axile; cotyledons 0 or minute" (Gardner and Thwaites). Pericarp in some species described

as fleshy and edible.—Trees or shrubs, glabrous, or young shoots pubescent or pilose. Leaves alternate, simple, often 3–5-plinerved, entire, exstipulate, frequently with alternating reduced stipuliform leaves. Flowers in axillary or supra-axillary spikes, ebracteolate or bracteoles minute.

A small genus, occurring also in Madagascar, the Malayan region, and Ceylon. The Ceylon plant is very nearly allied to the following.

The fruit of *A. laurina* is said in shape and size to resemble a pigeon's egg. It is sold at Sierra Leone in April and May. It is the "Monkey Apple" of Sabine.

1. **A. laurina,** *R. Br. in Sabine, Fruits of S. Leone, Trans. Hort. Soc.* v. 446. A small tree; extremities terete, pilose-pubescent, thinly silky-puberulous or glabrate. Leaves obliquely ovate-oblong or ovate-lanceolate, gradually acuminate, base unequal, the upper or sometimes both margins rounded, or base on luxuriant shoots sub-semicordate or very distinctly cordate, 3–5-nerved, early glabrous, thinly coriaceous; $2\frac{1}{2}$–6 in. long, 1–2 or even on luxuriant shoots $2\frac{3}{4}$ in. broad, frequently with stipuliform ovate-lanceolate or lanceolate leaves alternating with or near the base of the ordinary leaves. Petiole 1–2 lines. Flowers small, puberulous or tomentose, sessile on axillary or supra-axillary solitary or geminate slender spikes 1–3 in. long. Bracteoles very minute, ovate or lanceolate or obsolete. Calyx-lobes ovate. Petals narrowed below, deeply laciniate above with gland-tipped segments.—*Anisophyllum laurinum,* Don; Benth. in Fl. Nigrit. 342.

We have in the Kew herbarium three forms embraced by the above description, which may possiby prove to be specifically distinct. All are from—

Upper Guinea. They are severally characterized thus:—

Gaboon river, *Mann!* Leaves 4–6 in., base rounded, sometimes subcordate. Stipuliform leaves $\frac{1}{3}$–$\frac{3}{4}$ in. long. Petioles 1 line or less. Spikes (at least sometimes) from axils of reduced or stipuliform leaves. Bracteoles obsolete. Flowers papillose-puberulous.

Sierra d. Crystal, *Mann!* Leaves as above, but less rounded at base Petioles 2 lines or more. Stipuliform leaves minute or 0. Spikes slightly supra-axillary. Bracteoles squamiform. Flowers tomentose. A flowerless plant from Mr. Barter, labelled as "common everywhere round Free Town, Sierra Leone," agrees with this form so far as it goes.

Senegambia, *Leprieur!* A flowering specimen, with immature elliptic-lanceolate leaves, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long as yet. Flowers apparently all male. Bracteoles obsolete. Calyx sparsely puberulous, deeply 4-fid, base truncate. Petals but slightly excee ling the calyx, 3-fid, with a slender median segment, and the lateral segments bifid. Rudiment of ovary hairy.

ORDER LV. COMBRETACEÆ. (By Prof. Lawson.)

Flowers generally hermaphrodite. Tube of the calyx adnate to the ovary, constricted above it, or continuous with the limb and then elongate-tubular; limb 4–5-partite (rarely 6–8) generally campanulate; lobes valvate. Petals 0 or 4–5, often small, imbricate or valvate. Stamens 4–5 (or 8–10 in two rows); filaments subulate or filiform, erect, inflexed in æstivation, naked at the base (in *Gyrocarpus* enlarged by glands, or with alternating staminodes); anthers versatile, dehiscing longitudinally, or adnate and dehiscing by valves. Disk epigynous or

0. Ovary 1-celled; style simple, filiform, straight or rarely curved; stigma simple, acute, or obtuse, rarely truncate or obscurely lobed. Ovules 1 or 2–6, suspended by a slender funiculus (except in *Laguncularia*) from the top of the cell. Fruit coriaceous chartaceous or drupaceous; putamen crustaceous or bony, angled or sulcate or 2- or 4–5-winged, 1-seeded. Seed pendulous. Albumen 0. Embryo smooth or sulcate; cotyledons convolute or plicate or contortuplicate, often fleshy and oily; radicle small, superior.—Trees or shrubs, often scandent, rarely spinose. Leaves opposite or alternate, rarely verticillate, simple, petiolate, entire. Stipules 0. Flowers in spikes or racemes, less often paniculate or capitate, bracteate.

A considerable Natural Order, confined to the Tropics, but distributed in them round the world.

Suborder I. Combreteæ.

Lobes of the calyx valvate. Stamens without glands at the base, inserted into the limb of the calyx; filaments inflexed in æstivation; anthers versatile, with longitudinal dehiscence; pollen elliptical. Ovules 2–12. Flowers racemose or spicate.

* Petals 0. Limb of the calyx deciduous.

Tube of the calyx terete, not prolonged above the ovary. Stamens 10, exserted. Flowers generally spicate . . . . . 1. Terminalia.

Tube of the calyx compressed, not prolonged above the ovary. Stamens 5, exserted. Flowers in dense heads, bent downwards 2. Conocarpus.

Tube of the calyx 2-winged at the base, considerably prolonged above the ovary. Stamens 10, exserted. Flowers in dense heads . . . . . 3. Anogeissus.

* Petals 5.

† Limb of the calyx persistent.

Tube of the calyx cylindrical, attenuated above the ovary. Stamens 10, exserted. Leaves opposite. Flowers in heads and involucrate . . . . . 4. Guiera.

Tube of the calyx elongated, attenuated above the ovary. Stamens 5–10, exserted. Leaves alternate. Flowers racemose . 5. Lumnitzera.

Tube of the calyx turbinate, not prolonged above the ovary. Stamens 10, included. Leaves opposite. Flowers spicate . . . 6. Laguncularia.

†† Limb of the calyx deciduous. Stamens 10, more rarely 8.

Tube of the calyx straight, constricted above the ovary; limb small, campanulate or tubular-campanulate. Stamens straight, 10, in a few 8 . . . . . 7. Combretum.

Tube of the calyx curved or gibbous, constricted above the ovary, limb ample, tubular-campanulate. Stamens curved . . . . 8. Cacoucia.

Tube of the calyx very greatly prolonged above the ovary, slender; limb small. Stamens straight. Leaves opposite. Flowers racemose . . . . . 9. Quisqualis.

Suborder II. Gyrocarpeæ.

Lobes of the calyx imbricated. Stamens with alternating staminodes inserted into the base of the limb of the calyx; filaments straight in æstivation; anthers adnate, dehiscing by valves; pollen globose. Ovule 1. Leaves alternate. Flowers cymose.

10. Gyrocarpus.

1. **TERMINALIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 685.

Flowers hermaphrodite or polygamo-diœcious. Calyx-tube ovoid or cylindrical, not angled, constricted but not prolonged above the ovary; limb campanulate or cylindrical, 5-toothed, deciduous. Petals 0. Stamens 10, in 2 rows. Ovules 2, rarely 3, pendulous from the top of the cell. Fruit ovoid and angled, or a 2–5-winged samara, 1-seeded. Seed ovoid or round. Cotyledons convolute.—Trees or shrubs, never climbing; branches sometimes spinose. Leaves alternate, often crowded at the ends of the branches, sometimes pseudo-verticillate, entire. Flowers small, green or white, in long lax spikes.

A large genus, distributed throughout the Tropics of the whole world, though few species have a large area of distribution.

A. Fruit 2-winged.
  I. Leaves fascicled at the end of the branches.
    Leaf-bearing branches spinose . . . . . 1. *T. prunioides.*
    Leaf-bearing branches not spinose.
Leaves very broadly lanceolate or elliptic, acuminate; petioles ½ in. long . . . . . 2. *T. Brownii.*
Leaves oblanceolate, narrowed into very short petioles . . . . 3. *T. sericea.*
  II. Leaves scattered over the branches.
    a. Leaves thick and opaque.
      1. Fruit longer than broad.
        * Drupe compressed, with a longitudinal ridge.
Leaves and branches glabrous. Fruit 3–4 in. long . . . . . 4. *T. macroptera.*
Leaves and branches covered with a thick rust-coloured pubescence. Fruit 2 in. long . . . . . 5. *T. avicennioides*
        ** Drupe not compressed, smooth.
Leaves ovate or elliptical; petioles 2 in. long. Wings of the fruit ample, membranous . . . . . 6. *T. glaucescens.*
Leaves obovate; petioles ½ in. long. Wings of the fruit much reduced, thick and woody . . . . . 7. **T. Catappa.*
      2. Fruit as broad as long or broader, obdeltoid . . . . 8. *T. scutifera.*
    β. Leaves thin and pellucid . . . . . 9. *T. salicifolia.*
B. Samara 5-winged . . . . . 10. *T. glabra.*
  Fruit? . . . . . 11. *T. mollis.*

1. **T. prunioides,** *Laws.* Branches giving off at right angles short stout spine-like shoots, which bear fascicles of leaves at their tips; bark dark purple, deciduous. Leaves 1–2 in. long, obovate, glabrous above, covered beneath with long silky adpressed hairs. Flowers? . . . Samara stalked, elliptic or oblong, 2 in. long, 1½ in. broad; wings puckered at the margins, purple, glaucescent.

Mozamb. Distr. Two specimens gathered by *Dr. Kirk* at Tette!

2. **T. Brownii,** *Fresen. in Mus. Senck.* 1837, 152. Small tree; bark ash-coloured. Leaves in large tufts at the tips of the branches, 3–6 in. long, broadly lanceolate or elliptic, acuminate, glabrous above, puberulous beneath and on the petioles. Samara broadly lanceolate or elliptic, variable in size, 1½–3 in. long, purplish-red, glaucescent.—*T. confertifolia,* A. Rich. Fl. Abyss. i. 263. *T. hemignosta,* Steud. in Hb. Schimp. Abyss. *T. cycloptera,* R. Br. in Salt. Herb. Abyss.

Nile Land. Abyssinia, *Schimper!*
Mozamb. Distr. Tette, *Dr. Kirk!*
T. hemignosta is a variety with larger and more abundant pubescence, and smaller fruit.

3. **T. sericea,** *Bruch.; DC. Prod.* iii. 13. Bark steel-coloured. Leaves crowded together in pseudoverticels, oblanceolate-cuspidate, narrowed into the very short petioles. Flowers with very long subulate deciduous bracts. Fruit stalked, 1 in. long, roundish-ovate, puberulous, of a pale rust-colour.

South Central. Lat. 23°, *Chapman and Baines!*
The whole plant is covered with a short silky pubescence, which gives to it a silvery lustrous appearance.—A South African plant (*Harv. and Sond.*).

4. **T. macroptera,** *Guill. et Perr. Fl. Seneg.* 276, t. 63. Tree 60 ft. high, glabrous. Leaves alternate, 1 ft. or more long, 4 in. or more wide, ovate, tips sometimes reflexed, frequently narrowed into the petiole. Spikes axillary, glabrous. Fruit shortly stalked, 3–4 in. long, 1 in. broad, elliptical with a broad beak, apex retuse or emarginate, glabrous.

Upper Guinea. Senegambia (*Guill. and Perr.*).
Nile Land. Abyssinia, *Schweinfurth!* Sennaar, *Kotschy!*
A specimen gathered by Captains Speke and Grant at Madi, on the Upper Nile, allied to *T. macroptera*, has leaves coarsely reticulated, and hairy beneath. Its fruit also is broader and shorter, and not compressed; resembling much more that of *T. glaucescens*.

5. **T. avicennioides,** *Guill. et Perr. Fl. Seneg.* 277, t. 64. Small tree, 12–20 ft. Leaves petiolate, 6–12 in. long, $1\frac{1}{4}$–3 in. broad, oblong or oblong-lanceolate, densely puberulous below almost felted, becoming glabrous above, apex reflexed. Spikes numerous, woolly. Fruit shortly stalked, elliptical, densely puberulous.

Upper Guinea. Senegambia! Nupe, *Barter!* Sierra Leone, *Mrs. Hutton!*
North Central. Bornu, *E. Vogel!*
Nile Land. Abyssinia, *Schimper!*

6. **T. glaucescens,** *Planch. in Fl. Nigrit.* 336. Tree 20–30 ft.; young branches pubescent. Leaves ovate or ovate-elliptical, petioles nearly 2 in. long, glabrous above, puberulous beneath chiefly on the veins. Flowers? . . . . Fruit $1\frac{1}{2}$–2 in. long, $\frac{1}{2}$–$\frac{3}{4}$ in. broad, oblong, puberulous.

Upper Guinea. Quorra? *T. Vogel!* Aboh and Nupe, *Barter!*

7. ***T. Catappa,** *Linn.; DC. Prod.* iii. 11. Tree. Leaves 1 ft. long, 4–6 in. broad, variable in size, obovate, generally rounded at the apex, narrowed and abrupt or cordate at the base, glabrous; petioles very short, densely and rustily pubescent. Fruit $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, elliptic-globose, wings very narrow, woody.

Upper Guinea. Cultivated at St. Louis and Gambia.
This species is a native of India, and is probably not indigenous to Africa. The kernels are extensively eaten, and are said to taste like almonds.

8. **T. scutifera,** *Planch. in Herb. Hook.* Leaves obovate or ovate-elliptical and shortly acuminate, coriaceous, glabrous, 5–7 in. long, $2\frac{1}{2}$–$3\frac{1}{2}$ broad; petioles puberulous. Flowers in panicles, diœcious? Fruit broadly obdeltoid, wings not produced below, 1 in. long, $1\frac{1}{4}$ in. broad, puberulous, reddish.

Upper Guinea. Senegambia! Sierra Leone, *Afzelius!*
This is the only species from Africa with triangular fruit.

9. **T. salicifolia,** *Schweinf.* Leaves pellucid, lanceolate, 5–8 in. long, $\frac{3}{4}$–$1\frac{1}{4}$ broad, glaucous. Flowers? . . . Fruit? . . .

Nile Land. *Schweinfurth!*

10.* **T. glabra,** *Roxb. Fl. Ind.* ii. 440 (*Pentaptera*). Leaves oblong, 5–9 in. long, $1\frac{1}{4}$–2 in. broad, abrupt at both ends, slightly hairy on the veins and short petioles. Flowers? Fruit obovate, 5-winged.—*T. psidiifolia*, Del.; Walp. Rep. ii. 61.

Nile Land. From the Botanic Gardens at Cairo, from seeds obtained from Sennaar, where, however, it is supposed only to be cultivated.—An Indian species.

11. **T. mollis,** *Laws.* Tree; leaves 8–12 in. long, 4–6 in. broad, broadly oval with a thickened margin, felted beneath, at length glabrous above. Spikes woolly. Fruit? . . .

Nile Land. *Petherick!*

2. **CONOCARPUS,** Gærtn.; Benth. et Hook. f. Gen. Plant. i. 686.

Flowers in dense heads. Calyx-tube compressed, truncate, not prolonged above the ovary; limb urceolate, 5-fid, deciduous. Petals 0. Stamens 5. Ovules 2. Fruit small, angular, broadly obovate, bent downwards, subfleshy. Seed unequally ovoid. Cotyledons convolute.—Small glabrous or silky shrubs. Leaves alternate, somewhat fleshy, narrowed below, lanceolate, entire, biglandular at the base. Flowers minute, heads panicled at the ends of the branches. Fruit densely imbricated, pericarp corky.

1. **C. erecta,** *Jacq. Amer.* 78, t. 52; *DC. Prod.* iii. p. 16. Shrub to 10 ft. high. Flowering branches acutely angular, almost winged. Leaves lanceolate, generally glabrous or nearly so.

Upper Guinea. Shores of Senegambia, Babaghé Island (*Guill. and Perr.*). Sierra Leone, *T. Vogel!* Swamps of the Bonny River, *Mann!*
Abundant on the tropical coasts of America, but confined in Africa to Upper Guinea.

3. **ANOGEISSUS,** Wall.; Benth. et Hook. f. Gen. Plant. i. 687.

Flowers capitate. Calyx-tube compressed, 2-winged, prolonged above the ovary; limb campanulate or urceolate, 5-fid, deciduous. Petals 0. Stamens 10 in 2 rows. Ovules 2. Fruit small, straight, coriaceous, broadly trapezoidal, 2-winged, surmounted by the prolonged tube of the calyx. Seed ovoid. Cotyledons convolute.—Shrubs with glabrous or coriaceous leaves, alternate, petiolate, entire, not

glandular or obscurely so at the base. Flowers small, yellow; heads of flowers axillary on slender peduncles, globose.

A genus containing 4–5 species, all belonging to the Tropics of the Old World.

1. **A. leiocarpus,** *Guill. et Perr. Fl. Seneg.* i. 280, t. 65. Shrub 4–6 ft. high. Young branches slightly zigzag. Leaves broadly lanceolate or ovate, often acuminate. Fruit broadly 2-winged, 2–3 lines long, 3–4 lines broad, tipped with a short mucro, glabrous.—*Conocarpus leiocarpa*, DC. Prod. iii. 16. *C. Schimperi*, Hochst., and *C. parvifolium*, Hochst. in Hb. Schimp. Abyss.

Upper Guinea. Senegambia, (*Guill. et Perr.*).
Nile Land. Abyssinia, *Schimper!* White Nile, Bari country, *Speke and Grant!*
A. acuminatus, a native of India, has a much longer mucro surmounting its fruit.

4. GUIERA, Adans.; Benth. et Hook. f. Gen. Plant. i. 687.

Flowers in pedunculate involucrate heads. Calyx-tube narrowly ovoid, narrowed at both ends, terete or obscurely 5-angled, prolonged above the ovary; limb campanulate, 5-fid, persistent. Petals 5. Stamens 10 in 2 rows. Ovary crowned by the 5-lobed epigynous disk; ovules 4–5. Fruit coriaceous, curved, narrowly elongate-cylindrical, densely clothed with long silky hairs, crowned by the limb of the calyx. Seed narrow. Cotyledons convolute.—Shrubs with downy branches.

The single species of this genus is confined to Tropical Africa.

1. **G. senegalensis,** *Lam.; DC. Prod.* iii. 17. Young branches tomentose. Leaves opposite, broadly oval, subcordate, cuspidate, shortly petiolate, whole plant covered with minute black dots.—Guill. et Perr. Fl. Seneg. i. 282, t. 62, fig. 2.

Upper Guinea. Growing everywhere in the sandy regions of the Walo and Cayor country (*Guill. et Perr.*).
North Central. Bornu, *E. Vogel!*
Lower Guinea. Angola, Mossamedes, *Dr. Welwitsch!*

5. LUMNITZERA, Willd.; Benth. et Hook. f. Gen. Plant. i. 687.

Flowers in racemes. Calyx-tube elongate-oblong, narrowed at both ends, enlarged by the two adnate bracts, prolonged a little beyond the ovary; limb campanulate, equal or unequal, 5-lobed, persistent. Petals 5. Stamens 5 or 10 in 2 rows, exserted. Ovules 2–5. Fruit woody, ovoid-oblong, compressed, obtusely angled, crowned by the persistent calyx. Seed linear. Cotyledons convolute.—Shrubs. Leaves at the tips of the branches, alternate, subsessile, between fleshy and coriaceous.

Five species inhabiting the Eastern Tropics.

1. **L. racemosa,** *Willd.; DC. Prod.* iii. 22. Leaves obovate or spathulate. Flowers white.

Mozamb. Distr. A single specimen found by *Dr. Kirk* on the Zambesi river!

6. **LAGUNCULARIA,** Gærtn.; Benth. et Hook. f. Gen. Plant. i. 688.

Flowers polygamous, in long spikes from the axils of the upper leaves. Calyx-tube turbinate, not prolonged above the ovary; bracts 2, adnate; limb urceolate, 5-fid, persistent. Petioles 5, minute, caducous. Stamens 10 in 2 rows, included. Ovary crowned by an epigynous disk; ovules 2. Fruit coriaceous, crowned by the limb of the calyx, elongate-ovoid, subtrigonous. Seed obovoid-oblong.—Small shrub with opposite petiolate leaves, between fleshy and coriaceous.

One species common to the shores of Tropical America and Western Africa.

1. **L. racemosa,** *Gærtn.; DC. Prod.* iii. 17. Leaves oblong or elliptical obtuse, with 2 glands on the petiole just below the lamina.—*Conocarpus racemosa,* Linn. and *Schousboa commutata,* Spreng., DC. l.c.

Upper Guinea. Grand Bassa, and Fernando Po, *T. Vogel!* Sierra Leone, *Dr. Kirk!*

7. **COMBRETUM,** Linn.; Benth. et Hook. f. Gen. Plant. i. 688.

Flowers hermaphrodite or polygamous. Calyx-tube cylindrical or 4–5-angled, constricted but not prolonged above the ovary; limb campanulate tubular-campanulate or trumpet-shaped, 4–5-toothed, deciduous, generally villous at the base within. Petals 4–5, inserted between the lobes of the calyx. Stamens 8–10 in 2 rows. Ovary 1-celled; style subulate; ovules 2–6. Fruit coriaceous, 4–5-angled or -winged. Seed elongated, angled or sulcate. Cotyledons angled, plicate contortuplicate or deeply sulcate or convolute.—Shrubs, more rarely trees, generally scandent. Branches sometimes spinose. Leaves opposite or ternate, rarely alternate, petiolate, entire. Flowers in spikes, racemes or panicles.

A genus of very variable plants, which renders the limitation of the species exceedingly difficult. Very widely distributed throughout the whole of the Tropics. No Asiatic or American species have been found in Africa.

I. Flowers mostly pentamerous. Cotyledons convolute.

Flowers in panicles.	
Panicles large and diffuse.	
Young branches hispid. Flowers sessile or nearly so; bracteoles springing from the rachis	1. *C. hispidum.*
Young branches puberulous. Flowers pedicellate; bracteoles springing from the pedicels	2. *C. comosum.*
Panicles small and contracted.	
Young branches hispid	3. *C. Klotzschii.*
Young branches glabrous	4. *C. confertum.*
Flowers in racemes or spikes. Fruit winged. Climbing shrubs.	
Flowers small, under ½ in.	
Spikes conical, 4 in. long	5. *C. oxystachyum.*
Racemes about 2 in. long	6. *C. celastroides.*
Flowers large, above an inch in length and showy.	
Flowers red, secund: calyx-tube trumpet-shaped . .	7. *C. grandiflorum.*
Flowers not secund; calyx-tube swollen at the base .	8. *C. constrictum.*

Flowers not secund; calyx-tube tubular-campanulate . 9. *C. aculeatum.*
Flowers in spikes. Fruit winged. Herbaceous, erect . 10. *C. sericeum.*
Flowers in spikes or racemes. Fruit not winged, woody.
Fruit with 5 sharp angles . . . . . 11. *C. acutum.*
Fruit with 5 rounded angles . . . . . 12. *C. pentagonum.*

II. Flowers mostly tetramerous. Cotyledons angled plicate contortuplicate or deeply sulcate.
α Flowers panicled. Shrubs or trees.
Flowers collected at the ends of the peduncles, forming umbellate or capitulate spikes.
Leaves elliptical; wings of the fruit very thin and ample. Flowers red . . . . . 13. *C. racemosum.*
Leaves narrowly lanceolate, wings of the fruit small, hard, and scarcely membranous. Flowers dull yellow 14. *C. capituliflorum.*
Flowers fascicled or in small oblong spikes.
Limb of the calyx tubular-campanulate.
Flowers in vast spreading panicles, petals red, broadly ovate, rounded at the apex . . . . . 15. *C. paniculatum.*
Flowers on long narrow virgate branches. Petals red, orbicular concave . . . . . 16. *C. virgatum.*
Flowers cloth-like. Petals minute spathulate . . 17. *C. fuscum.*
Limb of the calyx cyathiform.
Petals orbicular, concave, reflexed . . . . . 18. *C. cuspidatum.*
Petals broadly and obtusely ovate, wedge-shaped below, not reflexed . . . . . 19. *C. mucronatum.*
β Flowers in axillary spikes or racemes, not panicled.
Shrubs or trees.
Leaves and branches lepidote.
Leaves densely lepidote, at least when young.
Leaves not viscid, petioles short.
Style without glands . . . . . 20. *C. elæagnoides.*
Style with stipitate glands . . . . . 21. *C. truncatum.*
Leaves not viscid, petioles longer . . . . . 22. *C. collinum.*
Leaves viscid, at least when young . . . . 23. *C. lepidotum.*
Leaves sparingly lepidote, at least when young.
Fruit winged. Trees or erect shrubs.
Fruit less than 1 in. long, 4-winged, wings equal.
Leaves 1 in. long, ovate . . . . . 24. *C. microphyllum.*
Leaves about 3 in. long by 2 in. broad, ovate-elliptical, dotted below with minute pale-coloured scales . . . . . 26. *C. altum.*
Leaves about 5 in. long by 2 in. broad, oblong-elliptical, covered beneath with large ruby-coloured scales . . . . . 27. *C. laxiflorum.*
Fruit less than 1 in. long, 3- or 2-winged.
Wings usually 3, unequal . . . . . 30. *C. anisopterum.*
Wings 2, equal . . . . . 31. *C. dipterum.*
Fruit 1½ in. long or more.
Leaves plane . . . . . 28. *C. rubiginosum.*
Leaves reflexed at the apex . . . . . 29. *C. apiculatum.*
Fruit winged. Scandent shrubs.
Fruit sessile, 9 lines long . . . . . 25. *C. angolense.*
Fruit pedicellate, 2 in. long, leaves obovate . 32. *C. Kirkii.*
Fruit pedicellate, 1½ in. long, leaves oblong-elliptic . . . . . 33. *C. paradoxum.*
Fruit not winged . . . . . 34. *C. tetragonum.*

Leaves not lepidote.
Leaves opposite.
Leaves covered with a dense velvety pubescence, at least when young.
Stamens exserted. Leaves when dry covered with a rich chocolate-coloured pubescence, 2½–6 in. long by 2–3½ in. broad. Fruit ½ in. long . . . . . 35. *C. holosericeum.*—
Stamens included. Leaves when dry covered with an ash-coloured pubescence above, yellowish beneath, 1½–2 in. long. Fruit 1 in. long . . . . . 36. *C. tomentosum.* —
Leaves glabrous or hairy, but not velvety.
Flowering branches leafless or nearly so.
Leaves with exceeding long acuminations 37. *C. Hartmannianum.*
Flowering branches leafy.
Leaves 1½–2½ in. long, coriaceous, with slender petioles. Fruit ½ in. long, broadly winged . . . . . 38. *C. myrtifolium.*—
Leaves 4–6 in. long, with short stout petioles, glabrous. Fruit 1 in. long . 39. *C. nigricans.*
Leaves 4–8 in. long, with very short petioles, hairy. Fruit oval, 8 lines long . 40. *C. trichanthum.*
Leaves 6–8 in. long, glabrous. Fruit 9 lines long, broadly and bluntly elliptical 41. *C. Petitianum.*
Leaves alternate, 3 in a whorl or subverticillate.
Flowering branches leafless, with deep unsightly scars; young leaves and fruit never viscid . . . . . 42. *C. reticulatum.*
Flowering branches leafy; young leaves and fruit viscid . . . . . 43. *C. glutinosum.*
Small suffruticose or herbaceous plants.
Leaves coarsely and prominently reticulated on the upper surface. Flowers in very short spikes, yellow 44. *C. argyrotrichum.*
Leaves finely reticulated. Flowers in spikes as long as the leaves, white . . . . . 45. *C. herbaceum.*
Leaves coriaceous. Flowers in stunted panicles, bright red . . . . . 46. *C. platypetalum.*

1. **C. hispidum,** *Laws.* Climbing often to the height of 30 ft. Old branches round, glabrous; younger hispid with red gland-tipped hairs. Leaves 6 in. long, 2½ in. broad, shortly petiolate, narrowly ovate from an abrupt or slightly cordate base, glabrous on both sides. Flowers nearly 1 in. long in large terminal panicles. Bracts ovate, stalked, foliaceous; bracteoles linear-lanceolate, as long as the flowers. Calyx-tube narrowly-ovoid, 5-angled, hispid; limb infundibuliform, teeth subulate. Petals oblanceolate ¼ in. long. Fruit? . . . .

Upper Guinea. Lat. 1° N., *Mann!*

2. **C. comosum,** *Don; DC. Prod.* iii. 20. Climbing; young branches puberulous. Leaves elliptical or oblong, acute, abrupt or slightly cordate at the base, glabrous, petioles very short and hairy. Flowers ½ in. long, shortly pedicellate in large spreading panicles; bracts ovate acute, bracteoles lanceolate acute, springing from the pedicels of the flowers. Calyx-tube lanceolate, limb tubular-campanulate, teeth broadly subulate. Petals ¼ in. long, lanceolate, veins nearly parallel and inos-

culating but sparingly. Fruit very shortly stalked, notched at both ends, wings papery, semitransparent.—Bot. Reg. xiv. t. 1165. *Poivrea comosa*, Benth., Fl. Nigrit. 339. *C. paniculatum*, Vent? DC. Prod. iii. 20. *C. intermedium*, Don, in Linn. Trans. xv. 433.

Upper Guinea. Frequent about Sierra Leone, Bagroo river, *Mann!*

A magnificent climber, whose vast panicles of blood-red flowers give a gorgeous appearance to the forests. *C. intermedium* of Don is a variety with looser racemes and broader bracts.

3. **C. Klotzschii,** *Welw. mss.* Climbing. Young shoots hispid, with yellowish, glandular hairs. Leaves opposite, petiolate or subsessile, elliptical with a subcordate base, acuminate, 4 in.–1 ft. long by 2–4 in. broad, glabrous above, hispid on the veins beneath with the intermediate spaces glabrous. Calyx-tube narrowed at both ends; limb funnel-shaped; teeth elongate-triangular. Petals elliptic-oblong, a little longer than the teeth of the calyx, vinous red. Stamens a little longer than the petals; style far exserted. Fruit pedicellate, 1 in. long, orbicular, with fragile, shining, semitransparent wings.—*? Poivrea glutinosa*, Klotzsch in Peters' Mossamb. Bot. 79.

Upper Guinea. Camaroons river, *Mann!*
Lower Guinea. Angola, between 2000–3000 ft., *Dr. Welwitsch!*

Mann's specimens differ from the above description in having somewhat shorter and broader calyx-teeth, and shorter and more triangular petals.

4. **C. confertum,** *Laws.* Twining shrub; young branches glabrous, bark dark brown. Leaves opposite, 3–5 in. long, 2–2¾ in. broad, ovate, acuminate, glabrous, petioles nearly 1 in. long, puberulous, bases of the petioles persistent forming spines. Flowers very shortly pedicellate, in dense, dwarfed, axillary panicles. Calyx-tube narrowed above the ovary, limb tubular-campanulate, slightly hairy within above the fleshy disk; teeth short and broadly triangular. Petals ovate, obtuse at the apex, scarcely longer than calyx-teeth; central vein giving off branches at acute angles and uniting near the margin. Stamens far exserted. Fruit? . . . . —*Poivrea conferta*, Benth., Fl. Nigrit. 338.

Upper Guinea. Fernando Po, *T. Vogel!*
Lower Guinea. Congo, *Smith!*

5. **C. oxystachyum,** *Welw. mss.* Shrub 3–5 ft., whole plant villous. Leaves 3 in. long, 1½ in. broad, shortly petiolate, opposite or alternate, ovate, acute, bent downwards, very dark-green above. Flowers 6 lines long in conical spikes 3–4 in. long; calyx-tube covered with fulvous hairs, limb with ashy-brown; teeth acute. Petals lanceolate, rigid, glabrous and red within, hairy on the outside. Fruit shortly pedicellate, about 1 in. long, 10 lines broad, emarginate at the apex, subcordate at the base, occasionally 4-winged, covered with a rusty pubescence.

Lower Guinea. Angola, *Dr. Welwitsch!*

6. **C. celastroides,** *Welw. mss.* Much branched, subscandent shrub. Leaves opposite, very shortly petiolate, about 2 in. long and ¾ in.

broad, broadly lanceolate, slightly attenuated at the apex and obtuse, sparingly lepidote beneath. Flowers in racemes longer than the leaves. Calyx-tube quadrangular; limb cyathiform. Fruit very shortly pedicellate, about 8 lines long, nearly orbicular, lepidote; wings papery, shining.

Lower Guinea. Angola, *Dr. Welwitsch!*

7. **C. grandiflorum,** *Don; DC. Prod.* iii. 21. Climbing shrub. Branches round, young ones hairy. Leaves opposite with very short hairy petioles, ovate-elliptical, shortly acuminate, 4 in. long, 2 in. broad, pubescent or at length glabrous. Flowers in short axillary and terminal spikes, secund, red, very large and handsome; bracts ovate, longer than the tube of the calyx. Calyx-tube lanceolate, very slightly constricted above the ovary, $\frac{3}{4}$ in. long, slightly puberulous on the outside, glabrous or nearly so within, teeth triangular acute, disk 0. Petals as long as the limb of the calyx, narrowly obovate, veins widely spreading and freely inosculating. Stamens usually 10, sometimes only 8, far exserted. Fruit shortly stalked, nearly round, emarginate at the apex, $1\frac{1}{4}$ in. long, 1 in. broad.—*Poivrea grandiflora,* Benth. in Fl. Nigrit. 337. *C. Afzelii,* Don in Linn. Trans. xv. 437.

Upper Guinea. Sierra Leone, *T. Vogel* and others!
Lower Guinea. Congo, *Dr. Welwitsch!*

8. **C. constrictum,** *Laws.* Semi-herbaceous shrub with long straggling volubile shoots; bark whitish. Leaves alternate, rarely opposite, $2\frac{1}{2}$—4 in. long, obovate-elliptical, shortly acuminate, rounded or obscurely cordate at the base, glabrous except on the veins beneath, covered with minute white dots above; base of the petioles indurated, and forming short strong spines. Flowers collected at the ends of the short mostly terminal racemes. Calyx-tube narrow, $\frac{1}{4}$ in. long; limb $\frac{1}{2}$ in. or longer, inflated at the base, trumpet-shaped above, glabrous within; teeth triangular, acute. Petals clawed, linear-lanceolate, fringed with minute hairs. Fruit? . . . . —*Poivrea constricta,* Benth., Fl. Nigrit. 337. *P. mossambicensis,* Klotzsch in Peters' Mossamb. Bot. 78, t. 13.

Upper Guinea. Sierra Leone, *T. Vogel!*
Lower Guinea. Congo, *Smith;* Angola, *Dr. Welwitsch!*
Mozamb. Distr. Lat. 7° S. (No. 5), *Speke and Grant!* Zanzibar, *Speke!*
The following are some of the more conspicuous forms:—

α. Leaves hairy beneath, more rigid and with particularly prominent veins. Angola, growing between the heights of 2000 and 3000 ft.

β. Leaves much larger, coriaceous, glabrous, with very prominent veins. Flowers smaller, densely pubescent, in longer spikes. Angola, *Dr. Welwitsch!*

γ. Leaves smaller, obovate and more membranous. Flowers much shorter and stouter. Mozambique, *Dr. Peters.*

δ. Leaves larger and more membranous, with reflexed apices. Flowers shorter and stouter. Congo, *Smith!*

If these forms should not prove to be distinct, this is one of the most widely distributed as well as variable species. The whole group may be known by the more or less numerous white dots on the upper surface of the leaves.

9. **C. aculeatum,** *Vent.; Choix. d. Pl.* 58. Shrub 10 ft. high, erect or ascending; young shoots pubescent, bark pale, shedding off in

fibres. Leaves alternate or subopposite, broadly ovate or oval, 1–2 in. long, pubescent when young; petioles persistent, forming recurved spines. Flowers pedicellate, in short, many-flowered, axillary and terminal racemes. Calyx-tube narrowly ovoid, constricted above the ovary; limb tubular-campanulate, pubescent. Petals 5, broadly lanceolate, unguiculate. Stamens 10. Fruit pedicellate, 5-winged, emarginate, broadly oval, about $\frac{3}{4}$ in. long.—*Sequiera nudiflora*, Reichb. in Sieb. Hb. Seneg. No. 35. *C. ovale*, R. Br. in Salt. Herb. Abyss. *Poivrea aculeata*, DC. Prod. iii. 18.

Upper Guinea. Senegambia!
North Central. Bornu, *E. Vogel!*
Nile Land. Abyssinia, *Schimper!* Nubia, *Kotschy!* White Nile, *Petherick!*

10. **C. sericeum,** *Don; DC. Prod.* iii. 21. Stem herbaceous or suffruticose, rising from a woody base. Leaves subopposite, lanceolate, obtuse, covered with a shining silky pubescence. Flowers collected at the end of the peduncle. Fruit? . . . .

Upper Guinea. Sierra Leone, *Smeathmann!*
Very similar in appearance and habit to *C. herbaceum.*

11. **C. acutum,** *Laws.* Shrub about 10 ft. high, climbing? Young branches compressed, purple, glabrous. Leaves scarcely petiolate, oval, 3–4 in. long, $1\frac{1}{2}$–2 in. broad, coriaceous, glabrous above, puberulous beneath. Flowers small in terminal (and axillary?) spikes, thick and cloth-like. Calyx-tube 5-angled; limb tubular-campanulate, with a fleshy lining at the base within; teeth acutely triangular, spreading. Petals ovate, concave, puberulous and cloth-like, white. Fruit ovate, acute, $1\frac{1}{2}$–2 in. long, 1 in. thick, with 5 sharp woody angles.

Upper Guinea. Niger, *Barter!*

12. **C. pentagonum,** *Laws.* Tree? Young branches round, hairy. Leaves opposite, shortly petiolate, oval or obovate, 5–8 in. long, 3–$3\frac{1}{2}$ in. broad, glabrous above, hairy beneath. Flowers? . . . . Fruit roundly-oblong, $1\frac{1}{4}$ in. long, 1 in. thick, with 5 rounded angles.

Mozamb. Distr. Rovuma river, *Dr. Meller!* A single specimen.

13. **C. racemosum,** *Beauv. Fl. Owar.* ii. 90, t. 118. Shrub, often climbing; branches puberulous, not spinose. Leaves shortly petiolate, opposite or alternate, 2–4 in. long, lanceolate-elliptical, sometimes shortly and obliquely acuminate, at length glabrous. Flowers in dense capituliform spikes arranged in irregular panicles; bracts large, oval or ovate; bracteoles linear-lanceolate, white. Calyx covered with ash-coloured pubescence; tube lanceolate, 4-angled; limb infundibuliform with 4 short cuspidate teeth, glabrous within. Petals obovate, 2 lines long. Stamens atropurpureous. Fruit elliptical, narrowed into the short pedicel, depressed at the apex and surmounted by the persistent base of the style.—*C. corymbosum*, Schum. et Thonn. Pl. Guin. 185. *C. leucophyllum*, Don, DC. Prod. iii. 21. *C. trigonoides*, Perr.; DC. Prod. iii. 20. *C. macrocarpum*, Beauv. Fl. Owar. ii. 90, t. 118 (fruit).

Upper Guinea. Camaroons river, *Mann!* Sierra Leone, *Barter!* Fernando Po, *Mann!*

Lower Guinea. Congo, *Smith!* Angola, *Dr. Welwitsch!*

Var. *flammeum*, Welw. mss. differs from the above in its darker coloured calyx, red stamens, and deep red bracts and leaves. Fruit nearly orbicular and often notched at the apex. This is probably the *C. macrocarpum* of Beauv.: Highlands of Angola and Sierra Leone.

Dr. Welwitsch observes of this shrub, that when it is in flower it gives to the country the appearance of being on fire, so abundant are its deep red flowers and bracts.

14. **C. capituliflorum,** *Fenzl; Schweinf. in Reliq. Kotsch.* 33. Leaves opposite or ternate, petiolate, lanceolate, margins undulate and thickened, 4–6 in. long, glabrous on both sides, dotted beneath with minute orbicular scales. Flowers sessile, in dense woolly pedunculate heads $\frac{1}{2}$ in. across, which are arranged in short terminal and axillary panicles; bracts woolly, small, subulate, caducous. Calyx-tube globular; limb broadly infundibuliform, teeth broadly triangular and somewhat inflexed, glabrous within. Petals small, spathulate-obovate, concave, entire or emarginate, fringed at the apex with a few delicate hairs. Fruit shortly pedicellate, oblong, acute, 1–1$\frac{1}{2}$ in. long by $\frac{1}{2}$–$\frac{2}{3}$ in. broad; wings narrow, woody.

Nile Land. White Nile, *Petherick!* Nubia, *Schweinfurth!* Madi (717), *Speke and Grant!*

A very distinct species.

15. **C. paniculatum,** *Vent.; DC. Prod.* iii. 20. Shrub, erect or climbing, 10–30 ft. Leaves subopposite or alternate, exceedingly variable in size form and texture, 3 in. long, broadly elliptical, cordate, cuspidate, puberulous; or 7 in. long, oblong, smooth and membranous, shortly acuminate with petioles 1 in. long; or 4 in. long by 2$\frac{1}{4}$ broad, coriaceous, glabrous above, downy beneath, with very short petioles; or 14 in. long by 5$\frac{1}{2}$ broad, oblong-obovate, tapering below, cuspidate, glabrous and membranous. Flowers red, fascicled, forming interrupted spikes which are arranged in gigantic terminal panicles. Calyx-limb tubular, almost black when dry. Petals very broadly ovate, almost orbicular, blood red. Fruit on slender pedicels, obovoid, emarginate, 1$\frac{1}{2}$ in. by 1 in., pale coloured.—*C. spinosum,* Don, DC. l. c.

Upper Guinea. Sierra Leone, *Don!* and others. Prince's Island, *Mann!* Fernando Po, *Barter and Mann!* Dahomey, *Barter!*

Lower Guinea. Angola, between 1500–2000 ft. *Dr. Welwitsch!*

A most variable species, as far as the leaves are concerned; but many of the specimens from which the description given above is taken are so poor, that it is possible there may be more than one species.

16. **C. virgatum,** *Welw. mss.* Shrub 5–7 ft. high.; young branches and leaves holosericeous with ferruginous pubescence; old leaves also distinctly tomentose. Leaves alternate, petiolate, oblong-lanceolate, 4–6 in. long. Flowers in numerous short dense spikes borne on virgate branches 3–4 ft. high. Calyx-limb infundibuliform with short hair-tipped teeth, limb and tube densely puberulous. Petals sessile, orbicular, concave, red.

Lower Guinea. Angola, between 3000 and 4000 ft., *Dr. Welwitsch!*

17. **C. fuscum,** *Planch. in Fl. Nigrit.* 339. Shrub, climbing, not spinous; young branches and flowers covered with rusty or fulvous pubescence. Leaves opposite, petiolate, 4–8 in. long, oblong or elliptical, shortly acuminate, pubescent when young. Flowers cloth-like, in short dense paniculate spikes. Calyx-tube ovoid, limb tubular-campanulate, teeth triangular acute. Petals minute, spathulate, white. Fruit on short slender pedicels $\frac{3}{4}$ in. long, suborbicular, notched at the apex.

Upper Guinea. Sierra Leone, *T. Vogel!* Grand Bassa, *Ansell!* Abbeokuta, *Dr. Irving!*

18. **C. cuspidatum,** *Planch. in Fl. Nigrit.* 340. Shrub, climbing, not spinous; young branches pubescent at first, but soon becoming glabrous. Leaves ovate-elliptical ovate or oblong, cuspidate or acuminate, rounded at the base, shortly petiolate, 3–6 in. long, 2–3 broad, glabrous, frequently minutely dotted beneath. Flowers in cylindrical paniculate spikes, rachis much flattened or grooved; scented. Calyx-tube very short, ovoid, limb cup-shaped with a few long hairs within, glabrous on the outside, dark brown; teeth minute. Petals small, nearly orbicular, reflexed, white. Fruit ? . . .

Upper Guinea. Onitsha, *Barter!* Sierra Leone, *T. Vogel!* Fernando Po, *Mann!* river Muni, *Mann!*

19. **C. mucronatum,** *Thonn.; DC. Prod.* iii. 20. Shrub 10–12 ft. high, scandent; branches pubescent. Leaves opposite or subverticillate, shortly petiolate, oval, 2–4 in. long, shortly acuminate, glabrous above, pubescent beneath, not lepidote. Flowers small, in axillary and terminal panicles. Bracts $\frac{1}{2}$ in. long, foliaceous, ovate, acute, hairy. Calyx-tube elliptical; limb widely campanulate, glabrous within; teeth very short forming 4 cuspidate points. Petals minute, very broadly and obtusely ovate from a wedge-shaped base. Fruit sessile, orbicular, with an acute base, about 4 lines in diameter.—*C. Smeathmanni,* Don in Linn. Trans. xv. 424.

Upper Guinea. Senegambia! Abbeokuta, *Barter!*

20. **C. elæagnoides,** *Klotzsch in Peters' Mossamb. Bot.* 73. A small tree, 15–20 ft., branches virgate, pubescent; bark silvery grey. Leaves opposite, petiolate, about 5 in. long by $1\frac{1}{4}$ in. broad, dark chocolate brown, glabrous above, pale and lepidote beneath. Flowers very small; racemes slender, cylindrical, densely lepidote. Calyx-limb campanulate and covered with large white circular scales. Petals unguiculate, varying from broadly spathulate to orbicular. Fruit orbicular, emarginate at the apex and cordate at the base, 8 lines to 1 in. long.

Lower Guinea. Angola, *Dr. Welwitsch!*
Mozamb. Distr. Tette, Zambesi, *Dr. Kirk!*

The specimens from the hills of Angola have shorter and broader leaves. This species is very closely allied to *C. truncatum,* from which it differs essentially in the shape of its leaves, and especially in its non-glandular style.

21. **C. truncatum,** *Welw. mss.* A large tree, young branches compressed and covered with reddish or ash-coloured scales, the whole plant otherwise glabrous. Leaves opposite, shortly petiolate, 2–3 in. long, narrowly obovate, densely lepidote on both sides, which gives to the plant a mealy appearance. Flowers small, in axillary and terminal spikes about the length of the leaves; buds pyramidal. Teeth of the calyx broadly triangular. Petals minute, obovate. Style covered with stipitate glands. Fruit very shortly pedicellate from a broad truncate base, tipped at the apex with the persistent base of the style, densely lepidote.

Lower Guinea. Angola, on the coast, *Dr. Welwitsch!*
Mozamb. Distr. Lupata, *Dr. Kirk!*

This species may be readily distinguished from all other African *Combreta* by its glandular style. The wood is described as being exactly like that of the lignum-vitæ. The native name for it in the Mozambique country is "Mozambiti."

22. **C. collinum,** *Fresen. in Mus. Senck.* 1837, 153. Shrub? erect; young branches flattened or slightly grooved, glabrous or sparingly lepidote. Leaves subopposite, petiolate, ¾ in. long, narrowly ovate or elliptical, 3–5 in. long, 1–2 in. broad, sparingly lepidote above, densely so beneath. Flowers about 2 lines long, in weak simple axillary spikes shorter than the leaves. Calyx-limb campanulate; teeth broadly triangular, fringed with minute hairs. Petals very broadly obdeltoid with undulated margins, shortly unguiculate. Fruit? . . . .

Upper Guinea. Nupe, *Barter!* Senegal!
Nile Land. On the banks of the Tacazze, *Schimper!* Gallabat, *Schweinfurth!* Madi, *Speke and Grant!*

Plants named by Planchon *C. elæagnifolium*, with flowers only, differ from the above in their broader and blunter leaves.

23. **C. lepidotum,** *Hochst.; Rich. Fl. Abyss.* i. 268. Tree; young branches compressed, lepidote. Leaves opposite, very shortly petiolate, 2–4 in. long, ovate, acute, glabrous above and covered with glands which secrete a viscid substance, densely lepidote beneath. Flowers in short spikes from the axils of the leaves which they about equal in length. Petals broadly obdeltoid, fringed with hairs. Fruit narrowly oblong, lepidote.—*C. punctatum*, Rich. l. c. 266; *C. glutinosum*, Hochst. in Hb. Schimp. Abyss. (not Guill. et Perr.) *C. vernicosum*, Fenzl in Flora, 1844, 312; *C. Quartinianum*, Rich. l. c. 266.

Nile Land. Abyssinia, Sennaar, *Schimper!* Nubia, *Kotschy!*
Lower Guinea. Angola? *Dr. Welwitsch!*

Under this species I have combined several varieties considered by Richard distinct species, as after the examination of numerous specimens I do not think the form of the leaves and the difference in the degree of scaliness and viscidity are sufficient by which to distinguish them. The most distinct form is *C. Quartinianum*, in which the leaves are much less viscid and scaly than in the rest, having little tufts of hair in the angles formed by the veins on the under surface. Dr. Welwitsch's specimens from Angola have broader leaves, which are covered with dense pubescence. It is called by some of the colonists the Oak Cavilla.

24. **C. microphyllum,** *Klotzsch in Peters' Mossamb. Bot.* 74. Shrub. not climbing; young branches round, pubescent. Leaves opposite, very

shortly petiolate or alternate, about 1 in. long, very broadly ovate, emarginate and subapiculate, dark green above, paler beneath. Flowers pubescent in axillary racemes shorter than the leaves. Teeth of the calyx triangular, acute. Petals ovate, shorter than the stamens. Stamens far exserted. Fruit elliptical, quadrangular, semimembranous.

Mozamb. Distr. Zambesi, *Peters!*

Flowering specimens of a plant gathered by Barter on the Niger agree with this description, except in the flowers, which are borne in slender spikes. The leaves also are not pubescent, but sparingly lepidote on both sides.

25. **C. angolense,** *Welw. mss.* Shrub, scandent. Leaves opposite or 3 in a whorl or alternate, 2–3 in. long by 1–1½ in. broad, obovate-oblong, cuspidate, cinereous, pellucidly punctate, pubescent. Flowers crowded at the ends of the spikes. Calyx-limb infundibuliform. Petals orbicular, fimbriated with stiff cilia, yellowish white. Fruit orbicular, 9 lines long, sessile, capitulate.

Lower Guinea. Angola, Golungo Alto, 1500–3000 ft., *Dr. Welwitsch!*

26. **C. altum,** *Perr.*; *DC. Prod.* iii. 20. Small tree, 20–25 ft.; young branches puberulous. Leaves ovate-elliptical, acuminate, 3 in. long by 2 broad, dotted below with minute pale coloured scales, glabrous above. Flowers small in axillary racemes. Calyx-limb widely campanulate; teeth triangular, glabrous within. Petals minute, obovate, shortly clawed, scarcely 1 line long, pinkish. Fruit pedicellate, orbicular, ½–¾ in., depressed or slightly emarginate at the base and apex, slightly puberulous.—*C. micranthum* and *C. parviflorum,* Don; DC. Prod. l.c. 21.

Upper Guinea. Nupe, *Barter!* Senegal!

C. micranthum appears to me to be a small variety of *C. altum,* differing from it only in its smaller leaves and fruit.

27. **C. laxiflorum,** *Welw. mss.* Tree, 25–35 ft. high. Leaves opposite or alternate, petiolate, oblong-elliptical, shortly and abruptly acuminate, about 5 in. long and 2 in. broad, glabrous above, covered beneath with large isolated ruby-coloured scales, pellucidly punctate. Flowers in simple or compound erect racemes. Calyx-tube quadrangular, limb almost square, teeth eventually spreading. Stamens exserted. Disk with 4 shallow obcordate lobes. Petals minute, oblong-lanceolate, undulate, pale yellow. Fruit pedicellate, about 10 lines long and 9 lines broad, base obtuse, tipped at the apex with the persistent base of the style, brownish yellow.

Lower Guinea. Angola, *Dr. Welwitsch!* Growing at the height of 2000–3000 ft.

A smaller tree from more exposed parts has obovate leaves 2½–3 in. long.

28. **C. rubiginosum,** *Welw. mss.* Tree, 20–25 ft.; young branches and petioles dark purple. Leaves opposite, broadly lanceolate, 4–6 in. long by 1½–2½ in. broad, with an obtuse or cordate often unequal base, dark green and shining above, ferruginous beneath; petioles slender, ¾ in. long, covered with small white distant scales above and larger densely

aggregated scales beneath which are white with a dark centre. Flowers? Fruit 2 in. by $1\frac{3}{4}$ in., nearly orbicular, generally emarginate at the apex and obtuse at the base, chocolate coloured, pedicels about $\frac{1}{3}$ in. long.

Lower Guinea. Hills of Angola, *Dr. Welwitsch!* Growing at the height of about 3500 ft.

29. **C. apiculatum,** *Sond. Fl. Capensis*, ii. 510. Small tree. Branches round, glabrous. Leaves opposite, shortly petiolate, elliptic or elliptical-oblong, $2\frac{1}{2}$–3 in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad, reflexed at the apex, glabrous. Flowers in solitary spikes as long as the leaves. Calyx-limb campanulate. Petals minute, obovate, fringed with hairs, yellow. Fruit cordate-ovate, 1–$1\frac{1}{2}$ in. long, 9 lines broad, lepidote, golden yellow, pedicels 3–6 lines long. (*Description from Sonder.*)

Var. *α.* Leaves glabrous on both sides, 3–6 in. long. Fruit pedicellate, $1\frac{1}{2}$ in. long, $\frac{3}{4}$ in. broad, shining and viscid, oblong or broadly elliptical, slightly emarginate. Pedicels nearly 6 lines long.

Var. *β.* Leaves at least when young puberulous. Fruit pedicellate, 1–$1\frac{1}{2}$ in. long, $\frac{3}{4}$ in. broad, broadly elliptical. Pedicels 4–6 lines long.

Mozamb. Distr. Between Tette and the sea, Zambesi, *Dr. Kirk!*

C. apiculatum is a Natal species, the true form of which is not reported from Tropical Africa. I believe the different specimens above described to be only varieties, but as I have seen no flowers, they may, on further investigation, prove distinct.

30. **C. anisopterum,** *Welw. mss.* Tree-like shrub, 6–8 ft. Leaves opposite, shortly petiolate, $1\frac{1}{4}$ in. long by 7 lines broad, ovate or obovate, downy. Flowers in very short densely-flowered spikes, often staminate only, glabrous. Calyx-tube acutely triangular, limb cyathiform with very obscure teeth. Petals unguiculate, obovate, yellow. Fruit with slender pedicels 4–5 lines long, obovate-elliptical, emarginate, shortly tipped with the persistent base of the style. Wings usually 3, sometimes 4, unequal. Nut globular.

Lower Guinea. Hills of Angola, *Dr. Welwitsch!* Growing at the height of 5000 ft.

31. **C. dipterum,** *Welw. mss.* Tree, 30–60 ft. Leaves alternate, petiolate, $4\frac{1}{2}$ in. long, $1\frac{3}{4}$ in. broad, or 3 in. by $1\frac{1}{2}$ in., ovate, shortly acuminate, glabrous save on the petioles. Flowers white, in small long-peduncled heads. Calyx-tube broadly lanceolate, attenuate at both ends, clothed with long dense hispid pubescence; limb cyathiform, with very shallow rounded lobes, glabrous on the outside. Petals unguiculate, obovate-orbicular, white turning yellow. Fruit in dense heads about 7 lines long, oval, attenuate at the base, notched at the apex, on radiating pedicels about 6 lines long, generally 2, more rarely 3 or 4-winged.

Lower Guinea. Angola, *Dr. Welwitsch!* Growing at the height of 2000 ft.

Var. *attenuata*, Welw. mss., has a smaller fruit with a gradually prolonged apex.

32. **C. Kirkii,** *Laws.* Climbing shrubs; young branches sparingly lepidote. Leaves opposite, obovate from a cuneate base, 3–4 in. long, 1–$1\frac{1}{2}$ in. broad, petioles $\frac{1}{2}$ in. long. Flowers in spikes from the base of

the leafy branches. Calyx-limb tubular-campanulate; teeth broadly triangular, fringed with minute hairs, nearly glabrous. Petals minute, obdeltoid. Fruit pedicellate, broadly oval, emarginate, 2 in. long, $1\frac{3}{4}$ in. broad, pedicels slender, 1 in. long or more, dark brown or of a brick-red colour.

Lower Guinea. Angola, 5000 ft., *Dr. Welwitsch!*
Mozamb. Distr. Tette, Zambesi, *Dr. Kirk!*

According to Dr. Welwitsch, the leaves and fruit of a variety of this plant, called by him *C. tinctorum*, are used by the natives as a yellow dye. It has fruit-stalks $1\frac{1}{2}$ in. long.

33. **C. paradoxum,** *Welw. mss.* A wide-trailing shrub. Leaves opposite, petiolate, nearly glabrous; young leaves oblong-elliptical, $4\frac{1}{2}$ in. long by $2\frac{1}{2}$ broad; adult leaves oblong-elliptical, shortly acuminate, $7\frac{1}{2}$ in. long by 3 in., pale yellow above, dark olive green beneath, sparingly lepidote and pellucidly punctate. Flowers in terminal fasciculated racemes 6 in. long. Calyx-tube quadrangular; limb very short and almost square, lined at the base with a large fleshy disk; teeth inflexed and forming 4 pockets. Petals obovate. Stamens incurved, rarely 4, and then opposite the petals. Fruit pedicellate, oblong-elliptical, about $1\frac{1}{2}$ in. long and $\frac{3}{4}$ in. broad, whole surface covered with a velvety glandular chocolate-coloured scurf.

Lower Guinea. Angola, *Dr. Welwitsch!*

34. **C. tetragonum,** *Laws.* Shrub; branches round, tomentose. Leaves opposite, very shortly petiolate, oval or elliptical, 3–5 in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in. broad, of soft texture, pubescent, veins beneath hairy, intermediate portions lepidote. Flowers? Fruit sessile, in simple axillary spikes, ovoid, $1\frac{1}{4}$ in. long, $\frac{3}{4}$ in. broad, with 4 sharp angles not winged, downy.

Mozamb. Distr. Senna, Zambesi, *Dr. Kirk!*

35. **C. holosericeum,** *Sond. Fl. Capensis*, ii. 510. Small tree. Leaves opposite, rarely 3 in a whorl, shortly petiolate, $2\frac{1}{2}$–6 in. long by 2–$3\frac{1}{2}$ broad, broadly ovate or elliptical, sometimes subcordate at the base, and notched at the apex, covered with a dense white velvety tomentum which turns to a rich chocolate brown in drying, sometimes quite deciduous in the old leaves. Flowers in axillary spikes 2 in. long. Petals minute, broadly reniform, depressed at the apex and fringed with hairs, shortly clawed. Fruit subsessile, elliptical, $\frac{3}{4}$–1 in. long, glandular, blood-red.—*Sheadendron molle*, Klotzsch in Peters' Mossamb. Bot. 76.

Lower Guinea. Angola, at the height of 5000 ft., *Dr. Welwitsch!*
Mozamb. Distr. Chiradzura mountains, *Dr. Kirk!*

Specimens collected by Dr. Welwitsch at a lower elevation in Angola have leaves with glandular veins on the under surface; fruit 14 lines long and 12 broad, nearly orbicular and shortly pedicellate. This is also a South African species.

36. **C. tomentosum,** *Don; DC. Prod.* iii. 21. Shrub, climbing; branches villose, with rust-coloured hairs. Leaves shortly petiolate, opposite, oblong-elliptical, mucronate, $1\frac{1}{2}$–2 in. long, ferruginous, villose

beneath, covered with long silky deciduous hairs above. Flowers in long woolly axillary spikes. Calyx-limb hemispherical, teeth almost obsolete. Petals small, obovate, entire, from a wedge-shaped base, reflexed. Stamens included. Fruit winged, elliptical, 1 in. long, emarginate, abrupt or slightly cordate at the base, covered with a short dark rich red pubescence.—*C. chrysophyllum*, Guill. et Perr. Fl. Seneg. 289.

Upper Guinea. Senegal! Sierra Leone, *Afzelius!*
South Central. Highlands of the Batoka country, *Dr. Kirk!*
Mozamb. Distr. Tette, Zambesi, *Dr. Kirk!*

37. **C. Hartmannianum,** *Schweinf. in Fl. Æthiop.* 24, t. 3. Tree; barren branches glabrous, flowering branches puberulous, with very few leaves. Leaves petiolate, ovate, acuminate, acuminations as long or longer than the rest of the leaf, glabrous, flaccid and shining. Flowers small, in short axillary spikes. Petals small, orbicular, shortly clawed. Fruit pedicellate, winged.

Nile Land. Nubia, *Schweinfurth!*
Lower Guinea. *Baines!*

38. **C. myrtifolium,** *Laws.* A shrub or small tree; branches glabrous or clothed with long tomentose hairs. Leaves coriaceous, opposite, with slender petioles 2–3 in. long, ovate-lanceolate, glabrous on both sides or at length becoming so. Flowers small, on long pedicels, in short axillary racemes, glabrous. Calyx-limb widely campanulate; teeth woolly, triangular, glabrous on the outside, filled with long white hairs within. Petals small, broadly obovate, shortly clawed. Fruit about $\frac{1}{2}$ in. long, with the wings often incomplete, on long pedicels, variable in shape; wings light yellow, disk darker.

Mozamb. Distr. Lupata and Tette, Zambesi, *Dr. Kirk!*
This plant is closely allied to *C. Kraussii*, Hochst., a South African species, in which the leaves are obovate.

39. **C. nigricans,** *Lepr. in Fl. Seneg.* 290. Small tree; branches round, subfastigiate; young branches and petioles covered with a fine ash-coloured pubescence. Leaves opposite, ovate-lanceolate, 4–6 in. long, glaucous above, finally puberulous beneath, drying blackish. Flowers? . . . Fruit in long lax racemes, oblong, about 1 in. long.

Upper Guinea. Senegambia (*Guill. and Perr.*).
Guill. and Perr. observe that this species is closely allied to *C. altum*, from which, however, it differs in the size and shape of its fruit, and in its leaves being puberulous and not lepidote beneath.

40. **C. trichanthum,** *Fresen. in Mus. Senck.* 1837, 155. Small tree; young branches pubescent. Leaves opposite, shortly petiolate, 4–8 in. long, elliptic or elliptic-lanceolate, acuminate, hairy often densely so when young, at length becoming nearly glabrous above. Flowers small, in axillary spikes. Petals minute, obdeltoid, fringed at the top with minute hairs. Fruit pedicellate, oval, wings slightly puckered, puberulous.

Var. Young leaves and inflorescence covered with tomentose pubescence.—*C. Schimperianum*, *C. Rüppellianum*, and *C. ferrugineum*, Rich. Fl. Abyss. i. 265–7;

C. molle, R. Br. in Salt. Herb. Abyss.; *Terminalia hirta*, Steud. in Hb. Schimp. Abyss.

Upper Guinea. Senegambia!
Nile Land. Abyssinia, *Schimper!*

41. **C. Petitianum,** *Rich. Fl. Abyss.* i. 266. Leaves opposite, very shortly petiolate, 6–8 in. long, oval-oblong, acute, glabrous above or sparingly lepidote, veins beneath covered with a rust-coloured pubescence, intermediate portions glabrous. Flowers in nearly sessile spikes from the axils of the upper leaves. Fruit shortly pedicellate, $\frac{3}{4}$ in. long, broadly and bluntly elliptical, lepidote within, hairy or shining.

Nile Land. Abyssinia, *Schimper!*
Very closely allied to *C. reticulatum*, from which it differs in its opposite, not whorled leaves, and in its rounder, smaller and not shining fruit. It is altogether a less coarse-looking plant.

42. **C. reticulatum,** *Fresen. in Mus. Senck.* ii. 154. Branches rough and tomentose, thicker and smoother at the nodes. Leaves generally 3 in a whorl, shortly petiolate, ovate or ovate-lanceolate, pubescent above when young, downy beneath, veins prominent; when falling off leaving deep and unsightly scars. Flowering branches naked. Flowers small, in short pedunculate woolly spikes, which are either fasciculate through the non-development of the primary rachis, or borne in dwarfed panicles from the axils of the old leaves. Petals minute, obovate, emarginate, very concave. Fruit with pedicels 4 lines long, oblong, subcordate, 1–1$\frac{1}{4}$ in. long, $\frac{3}{4}$ in. wide, glabrous or very slightly puberulous, shining.—*C. adenogonium*, Steud., Rich. Fl. Abyss. i. 266, No. 1799, named *C. reticulatum*, in Schimp. Hb. Abyss. sect. ter.; No. 622 in Schimp. Hb. Abyss. sect. secund. is *C. trichanthum*.

Nile Land. Abyssinia, *Schimper!* Madi (734.5), *Speke and Grant!*

43. **C. glutinosum,** *Perr.* (non *Hochst.*) *in Fl. Seneg.* 288, t. 68. Small tree, branching from the base; young branches furrowed, compressed at the nodes, viscid. Leaves very variable, alternate, or subopposite or verticillate, petiolate, broadly lanceolate oblanceolate or elliptic, finely pubescent or glabrous, generally viscid when young. Flowers pubescent, small, sessile, borne on short pedunculate axillary spikes. Calyx-limb broadly campanulate, teeth broadly triangular. Petals small, greenish white, unguiculate, obdeltoid, emarginate or almost orbicular. Fruit pedicellate, elliptical, emarginate at the apex, 4-winged.

Upper Guinea. Nupe, *Barter!* Senegal!
North Central. Musgu, *E. Vogel!*
Nile Land. Madi (No. 6) *Speke and Grant!*

44. **C. argyrotrichum,** *Welw. mss.* Herbaceous, simple, 1–2 ft. high. Leaves opposite, 3–4$\frac{1}{2}$ in. long by 1$\frac{3}{4}$–2 in. broad, nearly sessile, oblong-lanceolate, covered with silky pubescence on both sides, and coarsely and densely reticulated on the upper surface. Flowers in very short pseudo-capitate spikes on peduncles at least 6 times shorter than the leaves. Petals yellow, broadly obovate, fringed with hairs. Fruit

almost sessile, about 1 in. long and 8 lines broad, elliptical, tipped at the apex with the persistent base of the style, densely puberulous.

Lower Guinea. Angola, rising to 5000 ft., *Dr. Welwitsch!*
Very closely allied to the next species.

45. **C. herbaceum,** *Don, DC. Prod.* iii. 21. Stem herbaceous, simple, 1 ft. high, proceeding from a woody base. Leaves subopposite or alternate, lanceolate, mucronate, 3 in. long, covered with soft silky hairs, often at length glabrous on the upper surface. Flowers in simple axillary spikes nearly as long as the leaves. Petals small, oblong, white. Fruit roundly oblong, abrupt at both ends, $\frac{3}{4}$ in. long, shortly stalked.

Upper Guinea. Sierra Leone, *T. Vogel!* Nupe, *Barter!*

46. **C. platypetalum,** *Welw. mss.* Suffruticose; 4 in. to 1 ft.; young shoots covered with a silky pubescence. Lower leaves opposite, upper alternate, shortly petiolate, coriaceous, 1–3 in. long, elliptical-obovate, reflexed at the apex, veins prominent. Flowers in dense stunted panicles, frequently leafless. Calyx-limb elongate-campanulate, teeth short, cuspidate, vermilion. Petals sessile, orbicular, 1 line long, vermilion. Stamens generally 10. Fruit shortly pedicellate or sessile, elliptical, $1\frac{1}{2}$ in. long by 1 in. broad, vermilion.

Lower Guinea. Angola, abounding in the low shrubby pastures at 5000 ft., *Dr. Welwitsch!*
A beautiful species, readily known from the rest by its small habit and exquisite red flowers.

8. CACOUCIA, Aubl.; Benth. et Hook. f. Gen. Plant. i. 688.

Calyx curved, tube narrowly ovoid, rounded or 5-angled; limb ample, tubular-campanulate, furnished below the middle with a villous ring or a membranous annular disk, 5-fid, deciduous. Petals 5. Stamens 10 in two rows, curved, exserted; anthers ovate-cordate. Ovary 1-celled, style filiform, elongated, curved; stigma simple; ovules 3–6. Fruit coriaceous or membranous, 5-angled or broadly 5-winged, 1-seeded. Seed sulcate, elongated, thick and fleshy.—Shrubs with robust scandent branches. Leaves opposite. Flowers large, showy, bracteate, in simple or compound racemes.

A genus of 4 known species, found only within the Tropics of Western Africa and Eastern America.

A. Flowers in panicles.
  Flowering branches clothed with long silky pubescence. Bracts large, persistent . . . . . 1. *C. villosa.*
  Branches downy. Bracts caducous . . . . . 2. *C. paniculata.*
B. Flowers in simple terminal racemes.
  Fruit samaroid . . . . . 3. *C. bracteata.*
  Fruit subpentagonal . . . . . 4. *C. coccinea.*

1. **C. villosa,** *Laws.* Shrub, climbing to 12 ft. high; flowering branches with bracts and flowers densely clothed with long silky hairs.

Leaves opposite, ovate-elliptical, shortly petiolate, obscurely cordate at the base, at length glabrous. Flowers in vast leafy panicles, covered with long silky pubescence; bracts and bracteoles ovate, acuminate, large, almost hiding the flowers, persistent. Calyx-tube pentagonal, limb tubular-campanulate, $\frac{3}{4}$ in. long; teeth 5, subulate. Disk situated low down a little above the base, and consisting of long silky hairs arranged in tufts; glabrous below the disk, villous above it. Petals 5, lanceolate from an ovate base, nearly twice as long as the teeth. Stamens 10. Fruit samaroid, 5-winged, broadly elliptical, disk linear, wings ample, thin and fragile, puberulous.

Upper Guinea. Old Calabar, *Thomson and Mann!*
Lower Guinea. *Dr. Welwitsch!*

This species is readily recognised by the silky pubescence of the flowering shoots.

2. **C. paniculata,** *Laws.* Shrub twining to the height of 20 ft. Flowering branches puberulous. Leaves oblong-elliptical, very shortly acuminate, not cordate at the base, shortly petiolate, glabrous. Flowers puberulous, stalked, in gigantic panicles; bracteoles shorter than the flowers, deciduous. Calyx-tube 5-gonal, limb tubular-campanulate, $1\frac{1}{4}$ in. long, teeth triangular, base of the limb slightly gibbous and 5-lobed. Disk situated a little above the base of the limb, and consisting of a membrane forming 5 pockets, glabrous below the disk, sparingly pubescent above. Petals 5, obovate, rather acute. Stamens 10. Fruit? . . .

Upper Guinea. Onitsha, *Barter!* Gaboon river, *Mann!*

3. **C. bracteata,** *Laws.* Shrub, twining 10–15 ft. high; branches round, puberulous. Leaves ovate, shortly acuminate, cordate at the base, shortly petiolate, glabrous. Flowers in simple racemes, showy; bracts large, ovate, light yellow. Calyx-tube stalked, almost cylindrical, 5-angled; limb tubular-campanulate, slightly gibbous and lobed below, nearly 2 in. long, teeth 5, broadly triangular. Disk situated about $\frac{3}{4}$ in. above the base of the limb, and consisting of a ring of hairs; part below the disk glabrous, part above puberulous. Petals 5, obovate. Stamens 10. Fruit samaroid, 5-winged, orbicular, $1\frac{3}{4}$ in. long; disk very narrow, wings ample, very thin and fragile, puberulous.

Upper Guinea. Fernando Po, *Barter! Mann!* Cameroon Mountains, *Mann!*
Lower Guinea. Angola, *Dr. Welwitsch!*

4. **C. coccinea,** *Aubl.; DC. Prod.* iii. 22. Climbing shrubs, young branches round, puberulous, or villose. Leaves elliptical or oblong-elliptical, shortly acuminate, cordate and slightly unequal at the base, very shortly petiolate, glabrous. Flowers in gigantic upright woolly racemes; bracts small. Calyx-tube pentagonal, slightly narrowed above; limb tubular-campanulate, $1\frac{1}{2}$ in. long, densely woolly, teeth 5, subulate, from a broad base; disk close to the base of the limb, consisting of a ring of hairs; glabrous below the disk, puberulous above it.

Petals 5, broadly oblanceolate, rounded at the apex, red. Stamens 10. Fruit ovoid, acute at both ends, subpentagonal.

Upper Guinea. Bagroo river, *Mann!*

Our African species differs from the Brazilian *C. coccinea* in the greater length of the limb of the calyx, also the petals in the African species are narrower and longer; in all other respects they seem identical.

9. QUISQUALIS, Linn.; Benth. et Hook. f. Gen. Plant. i. 689.

Tube of the calyx ovoid, subterete below, not constricted above the ovary, greatly prolonged, tubular and very slender, deciduous; limb 5-partite, lobes small, patent or reflexed. Petals 5, obtuse. Stamens 10, short, exserted; anthers ovate. Ovary 1-celled. Style filiform, exserted. Ovules 3–4. Fruit dry, oblong, acute, with 5 narrow wings, coriaceous.—Climbing shrubs.

A genus of 2 species.

1. **Q. indica,** *Linn.; DC. Prod.* iii. 23. Shrub, often scandent, 8–15 ft. high; branches round, puberulous. Leaves opposite or subopposite, oval or obovate, often shortly acuminate and slightly cordate at the base, very variable in size and shape, glabrous or pubescent. Flowers $1\frac{1}{2}$–4 in. long, collected together in short spikes. Petals white, turning red. Bracteate or ebracteate.—*Q. ebracteata,* Beauv.; Fl. Owar. i. 57, t. 35; DC. l. c.

Upper Guinea. Camaroon river, *Mann!* Abbeokuta, *Dr. Irving!* Old Calabar, *Mann!* Nupe, *Barter!* Quorra, *T. Vogel!*

Lower Guinea. Congo, *Consul Burton!*

The African plants do not seem to differ essentially from those of Asia, in which the bracts are often wanting, while in the African specimens they are sometimes present. The only other species, *Q. parviflora,* is a native of the parts about Natal.

10. GYROCARPUS, Jacq.; Benth. et Hook. f. Gen. Plant. i. 689.

Flowers mostly unisexual. Calyx of the male flowers 4–7-partite with oblong-spathulate obtuse equal or unequal segments. Petals 0. Stamens 4–7; anthers broadly oblong, dehiscing by 2 valves. Female flowers with an ovoid calyx-tube, and with 2 lobes of the limb oblong, obtuse, persistent, accrescent. Petals 0. Ovary 1-celled, with a solitary pendulous ovule. Style 0. Fruit a woody drupe crowned with the 2 enlarged lobes of the calyx.

A genus of 1 species only, which is distributed throughout the Tropics.

1. **G. Jacquini,** *Roxb. Pl. Corom.* i. 2, t. 1. Large tree. Leaves alternate, on long petioles, glabrous or tomentose, very broadly ovate, on young trees often 1 ft. long and deeply 3-lobed, on older trees smaller, entire, or broadly and shortly 3-lobed, more or less acuminate, truncate or cordate at the base. Flowers cymose, very small and numerous; cymes springing from the axils of the upper leaves. Drupe

varying in size, about $\frac{3}{4}$ in. long. For synonymy see Bentham in Fl. Austral. ii. 505.

Lower Guinea. Angola, *Dr. Welwitsch.*

I have not seen a specimen, but Dr. Welwitsch informs me that he possesses it in his collection from Angola.

ORDER LVI. MYRTACEÆ. (By Prof. Lawson.)

Flowers regular or nearly so, hermaphrodite or by abortion polygamous. Calyx-tube adnate to the ovary, limb 4–5-lobed. Petals 4–5, inserted on the margin of the disk, imbricated before flowering and so overlapping as to be ball-shaped. Stamens indefinite, inserted upon the calycine disk, distinct or united at the base forming a ring; anthers 2-celled, versatile with longitudinal dehiscence. Ovary inferior, included in the calyx-tube, 1–5-celled; ovules 2 or more in each cell, erect or pendulous, anatropal or campylotropal, inserted upon an axile placenta. Style simple or none. Fruit a dry or fleshy berry, dehiscent or indehiscent. Seeds 1 or more in each cell, exalbuminous. —Trees or shrubs, with simple entire opposite or alternate leaves, often pellucidly punctate.

A huge Natural Order, extending over the warmer regions of the whole world.

Psidium pomiferum, L., the guava, a West Indian species, has been introduced into various parts of Tropical Africa. *Psidium guineense*, Swartz, "another species cultivated in the West Indies, is said to have been imported there from Guinea, but it does not appear that any specimens have been found in Africa." It is a variety of *P. Araça*, which is not a native of Africa.

Myrtus communis, L., is also found escaped from cultivation.

TRIBE 1. **Myrteæ.**—*Ovary 2–3-celled. Fruit a dry or pulpy berry. Leaves opposite, dotted* . . . . . 1. EUGENIA.

TRIBE 2. **Lecythideæ.**—*Fruit fibrous or fleshy. Leaves alternate, not dotted.*

Fruit fibrous, terete	2. BARRINGTONIA.
Fruit fibrous, winged	3. PETERSIA.
Fruit fleshy, globose	4. NAPOLEONA.

1. EUGENIA, Linn.; Benth. et Hook. f. Gen. Plant. i. 718.

Calyx-tube globose ovoid or turbinate, lobes 4. Petals 4. Stamens indefinite, distinct; anther-lobes parallel. Ovary 2–3-celled; style filiform. Ovules numerous. Fruit a subdrupaceous berry, crowned with the persistent limb of the calyx. Seeds few, 1–4, globose or compressed.—Glabrous trees or shrubs. Leaves opposite, coriaceous. Peduncles 1-flowered or arranged in cymose panicles.

Peduncles solitary or fascicled, axillary.

Flowers 1–4 in the axils of the leaves; leaves mostly small.

Leaves $\frac{3}{4}$–1 in. long, ovate or elliptical; flowers solitary	1. *E. coronata.*
Leaves 2 in. long, broadly ovate; flowers 2 in each axil	2.**E. Michelii.*
Leaves 2–3 in. long, lanceolate; flowers 2–4 in each axil	3. *E. salicifolia.*
Leaves 3–4 in. long, broadly elliptical, with recurved margins; peduncles 1 in. long or more	4. *E. calycina.*

Flowers 6 or more in the axils of the leaves, sessile or very shortly pedunculate.
Leaves not shining; flowers sessile . . . . . 5. *E. calophylloides.*
Leaves shining; flowers shortly pedunculate . . . . . 6. *E. memecyloides.*
Flowers in dense cymes or in 2–3-chotomous panicles, terminal.
Young branches round or obscurely angled . . . . . 7. *E. owariensis.*
Young branches acutely quadrangular, almost winged . . . 8. *E. cordatum.*

1. **E. coronata,** *Vahl, DC. Prod.* iii. 271. Shrub 6 ft. high, young branches slightly puberulous. Leaves ovate or elliptical, $\frac{3}{4}$–1 in. long, $\frac{1}{3}$–$\frac{1}{2}$ in. broad, margins slightly revolute, very shortly petiolate. Pedicels 1–3 lines long.

Upper Guinea. Niger, *Barter!*

2.* **E. Michelii,** *Lam.; DC. Prod.* iii. 263; *Bot. Mag.* t. 473. Shrub 10 ft. high, branches glabrous. Leaves nearly sessile, broadly ovate, with undulate margins, glabrous, coriaceous, shining, 2–2$\frac{1}{2}$ in. long, 1–1$\frac{1}{4}$ broad. Flowers about 4 in each axil; pedicels $\frac{1}{2}$ in. long.

Upper Guinea. *Barter!*
A West Indian species, here most probably an escape from cultivation.

3. **E. salicifolia,** *Laws.* Small tree, branches glabrous. Leaves lanceolate, acuminate, narrowed below into short petioles, glabrous, coriaceous, shining, 2–3 in. long, $\frac{3}{4}$–1 in. broad. Flowers very small, 2–3 in each axil; pedicels 1–2 lines long.

Upper Guinea. Bagroo river, *Mann!* Sierra Leone, *Afzelius!*

4. **E. calycina,** *Benth. Fl. Nigrit.* 358. Branches glabrous. Leaves petiolate, broadly ovate-elliptical, cuspidate, margins revolute, 2–3 in. long, 1$\frac{1}{2}$–2 in. broad, glabrous, coriaceous, shining. Flowers large, solitary; pedicels 1 in. long, or more.

Upper Guinea. Grand Bassa, *T. Vogel!*

5. **E. calophylloides,** *DC. Prod.* iii. 272. Branches densely downy when young. Leaves oblong-elliptical, shortly acuminate, petiolate, 4 in. long, glabrous, coriaceous, not shining. Flowers sessile, crowded in the axils of the leaves, downy.—*E. caryophylloides,* Benth. in Fl. Nigrit. 359.

Upper Guinea. Sierra Leone, *Smeathmann!* Fernando Po, *Mann!*
Lower Guinea. Congo, *Smith!*
A specimen from West Tropical Africa, gathered by Mann, has shorter broader and nearly sessile leaves, and fasciculate nearly sessile staminate flowers.

6. **E. memecyloides,** *Benth. Fl. Nigrit.* 359. Leaves petiolate, oblong-elliptical, shortly acuminate, 4–6 in. long, 2$\frac{1}{2}$ in. broad, with narrowed margins, coriaceous, glabrous, shining. Flowers shortly pedicellate, crowded in the axils of the leaves.

Upper Guinea. Grand Bassa, *T. Vogel!*
β. Leaves shorter, broader, more oblong, not shining.
γ. Leaves as long as in the type, but much broader, more acuminate, and not shining.
Both are from Fernando Po, collected by Mann. They may be distinct.

7. **E. owariensis,** *P. Beauv. Fl. Owar.* ii. 20, t. 70. Tree 30–40 ft. high, Leaves very variable, 3–5 in. long, 2–3 in. broad, lanceolate-ovate from a broad base, elliptical or even obovate, generally shortly acuminate, nearly sessile or with petioles 1 in. long.—*Jambosa owariensis*, DC. Prod. iii. 287. *Syzygium owariense*, Benth. in Fl. Nigrit. 359.

Upper Guinea. Fernando Po, *Mann!* Niger, *T. Vogel!* Gaboon river, *Mann!* Senegambia, *Heudelot!*

Lower Guinea. Congo, *Burton!*

Nile Land. Abyssinia, *Schimper!* Madi, *Speke and Grant!*

Mozamb. Distr. Zambesi, *Dr. Kirk!* Rovuma river, *Dr. Kirk!*

After examining a great number of specimens, I cannot find any reliable characters by which to separate this species from *Syzygium guineense*, Guill. et Perr. Fl. Seneg. i. 315, t. 72.

A specimen from the Zambesi, with twisted petioles and a very slender habit, is described by Dr. Kirk as sending down roots from the stem like a fig.

8. **E. cordatum,** *Laws.* Tree 40 ft. high; young branches acutely quadrangular, almost winged. Leaves subsessile, suborbicular or elliptical, cordate at the base, often clasping the stem, 2–3 in. long, by $1\frac{1}{2}$–$2\frac{1}{2}$ in. broad, glabrous, coriaceous, shining.—*β.* Leaves petiolate, rounded at the base, oblong-lanceolate, 3–4 in. long.—*Syzygium cordatum*, Hochst. in H. & S. Fl. Cap. ii. 521. *Syzygium cordifolium*, Klotzsch in Peters' Mossamb. Bot. 63, t. 11.

Mozamb. Distr. Manganya hills, *Dr. Meller!* Tette, *Dr. Kirk!*

Common about Natal.

E. Caryophyllus (Caryophyllus aromaticus, L.), the clove, is cultivated in the Mozamb. Distr.

2. **BARRINGTONIA**, Forst.; Benth. et Hook. f. Gen. Plant. i. 720.

Calyx-tube ovoid or turbinate; limb either closed in the bud and split up in flowering into 4–5 valves, or imbricate and 3–4-lobed. Petals 4, rarely 5, adnate to the base of the staminal cup. Stamens in an indefinite number of rows, connate at the base, forming a ring or shallow cup; anthers versatile; anther-cells parallel. Ovary 2–4-celled; ovules 2–8 in each cell. Fruit fibrous, round or subangular, pyramidal-ovoid or oblong, crowned with the limb of the calyx, 1-seeded.—Leaves alternate, crowded at the ends of the branches, not dotted. Flowers in lateral or terminal racemes or spikes.

1. **B. racemosa,** *Blume; DC. Prod.* iii. 288. Large tree. Leaves 10–20 in. long, cuneate-obovate, often unequal, acute, serrulate at the apex, subsessile. Calyx-limb 4-lobed, lobes ovate-oblong, persistent. Flowers $1\frac{1}{2}$ in. wide.

Mozamb. Distr. North of the Rovuma river, lining its banks for 20 miles, *Dr. Kirk!* Luabo river, *Dr. Kirk!* Zambesi, *Dr. Meller!*

8. **PETERSIA**, Welw.; Benth. et Hook. f. Gen. Plant. i. 721.

Calyx-tube narrowly ovoid-turbinate, with 4 herbaceous wings; limb with 4 short lobes alternating with the wings, imbricate. Pe-

tals 4, adnate at the base to the staminal ring. Stamens in an indefinite number of rows, cohering at the base forming a ring; anther-cells diverging. Ovary 2-celled; ovules indefinite. Fruit fibrous, including the wings broadly obcordate; wings 4, broad, membranous; 1-seeded.—Leaves alternate, with pellucid dots. Flowers small in short dense racemes, which are solitary in the axils of the upper leaves or dispersed in a corymb.

1. **P. africana,** *Welw. l. c.* Leaves obovate from a narrowed base, shortly petiolate, shortly acuminate, membranous. Fruit broadly obcordate, pedicellate, $2\frac{1}{4}$ in. long, 2 in. broad, beautifully fibrous.

Lower Guinea. Angola, *Dr. Welwitsch!*
The only species of the genus.

4. **NAPOLEONA,** Beauv.; Benth. et Hook. f. Gen. Plant. i. 723.

Calyx-tube turbinate; limb valvate, 5-fid. Petals, staminodia, and stamens in 4 concentric rows, and more or less adnate at the base: those of the exterior row, or petals, connate, forming an orbicular petaloid membrane, with 20–40 folds; those of the second row numerous, free or nearly so, narrowly ligulate and antherless; those of the third row connate more than the lower half and forming a cup 20-40-lobed, lobes inflexed, antherless; those of the inner row connate at the base both with each other and the neighbouring row, the free portions broadly ligulate, mostly bearing anthers; anthers oblong, adnate, 1-celled. Ovary 5-celled; style short, expanded into a very broad peltate disk. Fruit fleshy, globose. Seeds few.—Tree with alternate leaves and solitary axillary flowers.

1. **N. imperialis,** *Beauv. Fl. Owar.* ii. 29, t. 78. Tree. Leaves alternate, ovate or oblong, 4–18 in. long, glabrous, not dotted. Flowers red white or blue, solitary in the axils of the leaves; bracts scaly, imbricated on the very short pedicel.—DC. Prod. vii. 550. *N. Vogelii,* Hook. et Planch. in Fl. Nigrit. 360, t. 49, 50. *N. Heudelotii,* Juss. in Ann. Sc. Nat. sér. 3, ii. 227, t. 4. *N. Whitfieldii,* Decaisne in Rev. Hort. 1853, 301, t. 16.

Upper Guinea. Fernando Po, *Mann!* Senegambia, *Heudelot!* Sierra Leone, *Miss Whitfield!* Old Calabar, *Mann!*
For remarks on structure of flower, see Dr. Masters in Journ. Linn. Soc. x. 492.

Order LVII. MELASTOMACEÆ. (By Dr. Hooker.)

Flowers regular, hermaphrodite. Calyx-tube free, or more or less adnate to the ovary; limb various, truncate lobed calyptriform or of deciduous segments, imbricate, rarely valvate in bud. Petals inserted in the mouth of the calyx and equalling its lobes in number, imbricate in bud. Stamens usually twice as many as the petals, regular inclined or declinate, equal or the alternate smaller or rudimentary; filaments inflexed in æstivation; anthers 2-celled, usually bursting by

one or two pores, rarely by slits, connective often produced below into a pedicel, which is often tubercled at its base, or spurred before or behind or both. Ovary 2- or more -celled (1-celled in *Memecylon*); style terminal, usually slender, stigma simple or capitate; ovules minute, anatropous, crowded on placentas that project from the inner angles of the cells (whorled round a central placenta in *Memecylon*). Fruit a loculicidal capsule included within the calyx-tube or a berry. Seeds usually minute, cochleate or angular (in *Memecylon* solitary and large); albumen 0; embryo terete or subglobose in all but the *Memecyleæ* which have a large radicle and convolute or consolidated cotyledons.—Herbs shrubs or trees, sometimes epiphytic or climbing. Stem usually 4-angled; branches opposite. Leaves opposite, exstipulate, usually 3–5-nerved. Inflorescence various.

A very large Tropical American order, less abundant in Asia, and comparatively rare in Africa.

Suborder I. Melastomeæ.

Ovary 1- or more -celled; ovules numerous; placentas in the inner angles of the cells. Fruit many-seeded. Seeds minute; embryo minute, terete or subglobose.

Tribe 1. **Osbeckieæ.**—*Ovary altogether or partially free, its top convex. Capsule enclosed in the dry rarely fleshy calyx-tube, crown convex or conical, usually hispid at the tip. Seeds minute, cochleate. Inflorescence various.*

* *Anthers equal or nearly so.*

Calyx glabrous. Anthers 8; connective 2-tubercled at the base . 1. Nerophila.
Calyx hispid or bristly. Anthers 8 or 10; connective dilated and 2-tubercled at the base, not lengthened below. Ovary hispid at the top . . . . . 2. Osbeckia.
Calyx glabrous. Anthers 8 or 10, broad; connective not tubercled, elongated below and continuous with the filament. Ovary glabrous . . . . . 3. Guyonia.
Calyx bristly. Anthers 8, narrow, pore large; connective short or produced and 2-tubercled at the base. Ovary crowned with bristles . . . . . 4. Antherotoma.
Calyx glabrous. Anthers 10, connective dilated and produced at the base, notched in front . . . . . 5. Dinophora.

** *Anthers unequal; connective of the larger usually much produced at the base.*

Anthers 10; not or very shortly produced; 2-tubercled in front; flowers capitate. Bracts large, persistent . . . . . 6. Tristemma.
Anthers 8–10, connective of the larger produced at the base with long appendage in front. Inflorescence and bracts various . . 7. Dissotis.

Tribe 2. **Sonerileæ.**—*Ovary more or less adnate to the calyx-tube; its top flat or depressed, angular. Capsule enclosed in the dry calyx-tube; crown broad, truncate, depressed, with 3–5 flat facets, which are often produced into erect scales. Seeds straight, angular, never cochleate. Inflorescence usually scorpioid.*

Anthers 10, very unequal, connective lengthened at the base, and appendaged in front . . . . . 8. Amphiblemma.
Anthers 10, sub-equal, connective lengthened at the base, and appendaged in front . . . . . 9. Calvoa.

Tribe 3. **Medinilleæ.**—*Ovary almost or wholly adnate to the calyx-tube. Fruit a berry, rarely a capsule, crowned by the calyx-limb, or areolate; crown convex, glabrous or bristly. Seeds usually obovoid or pyramidal, never cochleate.*

Anthers 10, very unequal, connective much lengthened, with 2 anticous and no posticous spurs . . . . . 10. Sakersia.
Anthers 10, very unequal; connective much lengthened, with 2 anticous and a posticous spur . . . . . 11. Dicellandra.
Anthers, 8, 10, 12, subequal; connective not lengthened below . 12. Medinilla.

Suborder II. Memecyleæ.

Ovary either 1-celled with the ovules whorled round a central placenta, or 2- or more -celled, with few collateral ascending ovules in the axis of each cell. Fruit few-seeded. Seeds large; embryo large, cotyledons plano-convex or subfoliaceous.

Ovary 1-celled; ovules whorled . . . . . 13. Memecylon.

1. **NEROPHILA,** Naud.; Benth. et Hook. f. Gen. Plant. i. 744.

Calyx shortly campanulate, glabrous; lobes 4, subulate-lanceolate, ciliate, persistent, with minute alternating teeth. Petals 4, obovate, apiculate. Stamens 8, filaments thickened below; anthers equal, linear-oblong, pore single, connective obscurely tubercled at the base. Ovary free, 4-celled, top bristly; style filiform, stigma simple. Capsule 4-valved. Seeds cochleate.—A small annual erect setulose herb. Leaves few, sessile, ovate or oblong, obscurely serrate. Flowers 1–3 at the tips of the branches, small, yellow, involucrate.

The only species, confined to Senegambia.

1. **N. gentianoides,** *Naud. in Ann. Sc. Nat. sér.* 3, xiv. 119, and xiii. t. 8. Stem 4–8 in., 4-gonous, simple or 3-chotomously branched, very slender, strict. Leaves $\frac{1}{4}$ in., subacute, setulose on both surfaces. Flowers capitate on capillary erect branches; heads surrounded by an involucre of 4 leaves like the cauline, about $\frac{1}{4}$ in. in diameter. Calyx-lobes subulate-lanceolate. Anthers erect, yellow.

Upper Guinea. Senegambia, in marshes of the Senegal river, *Heudelot!*

2. **OSBECKIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 744.

Calyx-tube ovoid urceolate or subglobose, usually produced beyond the ovary, hispid bristly or clothed with scales that bear pectinately or stellately arranged bristles, of which a series often alternates with the calyx-lobes; lobes 5, rarely 4 (deciduous in the African species). Petals 5, rarely 4, obovate. Stamens 10, rarely 8, equal or subequal; anthers linear-subulate, large or small, incurved or sigmoid; connective shortly or not at all produced, usually dilated or 2-tubercled at the base. Ovary adherent, 5- rarely 4-celled, top bristly; style slender, stigma simple or capitellate. Capsule small, sunk in the dry calyx-tube, 4–5-valved at the top. Seeds minute, cochleate.—Herbs or shrubs, usually erect and hispid strigose or scabrid. Leaves 3–7-

nerved, entire or serrulate. Flowers capitate panicled or sub-racemose, rose-coloured or purple.

A very large Tropical Asiatic genus, closely allied to *Dissotis*, and only distinguishable by the structure of the anthers.

Leaves ovate, petioled. Anthers minute.
- Fruiting calyx with a long cylindric top . . . . . 1. *O. tubulosa.*
- Fruiting calyx with a short top . . . . . 2. *O. multiflora.*

Leaves oblong-lanceolate, subsessile. Anthers large . . . . 3. *O. senegambiensis.*

1. **O. multiflora,** *Sm. in Rees Cycl.* xxv. Stem 4 ft., shrubby below, branched, leafy; branches slender, 4-angled, strigose; nodes obscurely bristly. Leaves $2\frac{1}{4}$–4 in. by $\frac{3}{4}$–$1\frac{1}{2}$ in., rather membranous, ovate or ovate-lanceolate, acuminate, obscurely serrulate, 5-nerved, base rounded or subcordate, dark green and scabrid above, with short appressed bristles, pale green and substrigose below, especially on the nerves; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. Flowers 5-merous, small, $\frac{1}{4}$ in. in diameter, pale rose-coloured, in very short terminal panicled racemes that form hispid balls in flower but lengthen in fruit; bracts green, shorter than the calyx, ovate-lanceolate, ciliate. Calyx-tube turgid, $\frac{1}{4}$ in., densely bristly and clothed above with scales, crowned by stellately and palmately arranged bristles; lobes small, subulate, tipped with stellate bristles, very deciduous. Petals small, $\frac{1}{4}$ in. long, obovate, tip ciliate. Anthers all equal and similar, $\frac{1}{6}$ in., about equalling the slender filament; connective very shortly produced, and 2-tubercled in front. Style slender, stigma capitellate. Capsule globose, sunk in the shortly urceolate, hispid, ribbed calyx-tube, which is $\frac{1}{3}$ in. long, 5-valved and hispid at the top.—DC. Prod. iii. 143; Benth. in Fl. Nigr. 347. *Melastoma Afzelianum*, Don in Trans. Wern. Soc. iv. 291; DC. Prod. iii. 147.

Upper Guinea. Sierra Leone, *Afzelius! Don!* Onitsha, *Barter!*

2. **O. tubulosa,** *Sm. in Rees Cycl.* xxv. Annual. Stem erect, 1–3 ft., sparingly branched and leafy, weak, acutely 4-angled, with a row of appressed bristles at the angles, and long erect ones at the nodes; branches setose. Leaves distant, $1\frac{1}{2}$–$3\frac{1}{2}$ in. by 1–2 in., membranous, ovate, acute, 5-nerved, margins cartilaginous, obscurely waved or crenate, substrigosely hairy on both surfaces; petiole $\frac{1}{4}$–$\frac{1}{3}$ in., hispid. Flowers sessile, 5-merous, solitary or in terminal, interrupted, unilateral cymes; bracts 2, much shorter than the calyx, ovate, membranous, ciliate, very deciduous. Calyx-tube $\frac{1}{2}$ in., urceolate, ventricose below, scabrid and covered with persistent scales crowned by stellately arranged bristles; upper part tubular with deciduous bristle-crowned scales; lobes 5, shorter than the tubular portion, ovate or subulate, acuminate, ciliate and bristle-pointed, very early deciduous. Petals small, $\frac{1}{10}$ in., obovate, purple? Anthers minute, $\frac{1}{16}$ in., all equal; connective very shortly produced, very minutely tubercled in front, filaments $\frac{1}{10}$ in., slender. Style filiform, stigma capitellate. Capsule adherent to the turgid part of the calyx-tube, its free top crowned with a pencil of white hairs, 4-valved.—DC. Prod. iii. 143; Benth. in Fl. Nigr. 345.

Upper Guinea. Sierra Leone, *Afzelius! Don! Vogel! Barter!* Fl. May.

3. **O. senegambiensis,** *Guill. et Perr. Fl. Seneg.* i. 310. Stems many, from a woody rootstock, 1–1½ ft., ascending, stout, branched, acutely 4-angled, scabrid; nodes with long spreading bristles. Leaves ¾–1½ in. by ¼–⅔ in., coriaceous, elliptic or oblong-lanceolate, acute, pungent, 3-nerved, margins cartilaginous, obscurely serrate, equally strigillose on both surfaces; petiole ⅒–⅛ in. Flowers ¾ in. diameter, in short terminal racemes, shortly pedicelled; bracts shorter than the calyx, ovate, concave, scarious, deciduous. Calyx-tube ¼ in., scabrid, with distant, short, simple or forked bristles; lobes linear-oblong, bristle-pointed, ciliate, as long as the tube, deciduous; appendages short, stout. Petals broadly obovate, ciliate, ¼ in. Anthers all equal and similar, equalling the filaments; connective not produced, 2-tubercled. Capsule enclosed in the urceolate, 10-costate calyx-tube, top bristly.

Upper Guinea. Senegambia, *Perrottet!* Cape Verd district, *Döllinger* (in Herb. Gay.)!

3. GUYONIA, Naud.; Benth. et Hook. f. Gen. Plant. i. 745.

Calyx-tube hemispheric, glabrous or with a few long cilia; lobes 5, acute, equalling the tube, persistent. Petals ovate-lanceolate, acute. Stamens 8 or 10, equal; anthers similar orbicular-ovoid, pore minute, connective produced at the base and jointed on the apex of the filament with a minute tubercle at the joint. Ovary almost adherent, top tumid, glabrous; style flexuous; stigma capitate. Fruit capsular? Seeds cochleate.—Slender, glabrous, or sparsely ciliate, branched, annual herbs. Stems filiform. Leaves small, petioled, membranous, rhombic-ovate, subobtuse, serrulate. Flowers axillary, solitary or few, rose-coloured.

Flowers 5-merous . . . . . 1. *G. tenella.*
Flowers 4-merous . . . . . 2. *G. ciliata.*

1. **G. tenella,** *Naud. in Ann. Sc. sér.* 3, xiv. 150, t. 6. Glabrous. Branches 6–10 in., many, erect, from a creeping stem. Leaves ⅓–½ in. long and broad; petioles ⅙–¼ in. Flowers shortly pedicelled, ⅓ in. diameter, 5-merous.

Upper Guinea. Rare in marshes and rivulets of Senegambia, *Heudelot.* I have seen no specimen.

2. **G. ciliata,** *Hook. f.* Sparsely ciliate with slender pale bristles on the stem and leaves above. Stem 4-angled, erect from a prostrate rooting base. Leaves about ⅔ in. long and broad, glaucous beneath. Flowers solitary, 4-merous. Calyx-tube with a few long cilia; lobes 4, subulate-lanceolate, with long bristles. Petals not seen.

Upper Guinea. Sierra Leone, *Afzelius!*
Possibly a ciliate 4-merous state of *G. tenella.* I have seen only a single specimen.

4. **ANTHEROTOMA**, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 745.

Calyx broadly campanulate, setose; lobes 4–5, triangular, persistent, alternating with bristles or stellately bristly appendages. Petals 4–5, obovate, tip setose. Stamens 8–10, equal; anthers similar, oblong, terete, truncate, pore large; connective simple or produced and 2-tubercled at the base. Ovary adherent halfway, 4–5-celled, tip with a crown of bristles; style filiform; stigma simple. Capsule membranous, 4–5-valved. Seeds cochleate.—Small, erect, slender, subsimple, setose annuals. Leaves subsessile, ovate-oblong, acute, quite entire or obscurely serrate. Flowers small, 3-nate or subcapitate, involucrate.

A small genus, confined to Tropical Africa and Madagascar.

Flowers 4-merous . . . . . 1. *A. Naudini.*
Flowers 5-merous . . . . . 2. *A. Afzelii.*

1. **A. Naudini,** *Hook. f.* Stem 3–6 in., 4-angled, rarely branched. Leaves in very few pairs, $\frac{1}{3}$–$\frac{1}{2}$ in., variable in breadth. Flowers surrounded by 4 floral leaves, shortly pedicelled, $\frac{1}{3}$ in. in diameter, 4-merous. Anthers with the connective produced below, 2-tubercled at the base.—*Osbeckia antherotoma*, Naud. in Ann. Sc. Nat. sér. 3, xiv. 56.

Nile Land. Tigre in Abyssinia, *Schimper!* (1863–8, No. 1237.)
Also found in Madagascar and Mayotte Island.

2. **A. Afzelii,** *Hook. f.* Stem 6–8 in., 2–3-chotomously branched; nodes long-ciliate. Leaves $\frac{1}{3}$–1 in. by $\frac{1}{4}$–$\frac{1}{2}$ in., shortly petioled, linear or elliptic-oblong or ovate, sparsely setose on both surfaces, obscurely serrate. Flowers crowded, 5-merous, subcapitate, $\frac{1}{3}$ in. in diameter. Anthers seated on the very slender subulate tip of the filament; connective obsolete below.

Upper Guinea. Sierra Leone, *Afzelius!*
In the form of the connective and 5-merous flowers, this differs remarkably from *A. Naudini*, but the habit and all other characters are so similar that I cannot think it should constitute a separate genus. From *Guyonia*, with which it agrees better in the anthers, it differs in the far more important characters of calyx and stigma.

5. **DINOPHORA**, Benth.; Benth. et Hook. f. Gen. Plant. i. 745.

Calyx glabrous, between turbinate and urceolate; limb membranous, sinuate-toothed. Petals 5, broadly ovate, subacute. Stamens 10, equal, anthers similar, linear-subulate, pore single; connective shortly produced at the base, dilated and notched in front. Ovary adhering by 5 ribs to the calyx-tube, glabrous; style filiform, narrowed at the base, stigma truncate. Capsule membranous, bursting irregularly or subvalvate. Seeds minute, cochleate.—A glabrous shrub, branches herbaceous, 4-angled. Leaves petioled, oblong-ovate or lanceolate, base

cordate, membranous, sharply ciliate-serrulate. Flowers in lax, terminal, spreading panicles; pedicels long, slender; bracts minute.

A single species.

1. **D. spenneroides,** *Benth. in Fl. Nigr.* 355. Stem 3–5 ft., base woody, much branched; branches herbaceous, 4-gonous, usually glandular-ciliate at the nodes. Leaves unequal, 2–4 in., acute or acuminate, 5–7-nerved, with a few scattered cilia above; petiole of one leaf usually $\frac{1}{2}$ in., of the other about twice as long. Panicle with very slender, divaricating branches, floriferous at the tips and axils; pedicels $\frac{1}{3}$–1 in.; bracts subulate. Calyx $\frac{1}{4}$ in., smooth, mouth rather contracted. Ovary included.

Upper Guinea. Fernando Po, Fl. Nov.–Dec., *Vogel!*

6. **TRISTEMMA,** Juss.; Benth. et Hook. f. Gen. Plant. i. 746.

Calyx ovoid or oblong, glabrous, naked, or with 1 or more rings of bristles; lobes 5, persistent, reflexed. Petals 5, obovate. Stamens 10, equal or subequal; anthers all similar, narrowly linear-oblong, pore 1; cells undulate; connective not or very shortly produced at the base, where it is 2-tubercled in front. Ovary half-adherent, 5-celled, top setose; style filiform, curved, stigma simple. Capsule or berry bursting irregularly, rarely 5-valved at the top. Seeds minute, cochleate.—Shrubs, erect or prostrate, branched, often setose, branches 4-angled. Leaves petioled, elliptic or ovate or acute, quite entire, 5–7-nerved. Flowers sessile, terminal, 1–3, or many panicled; bracts many, large; enclosing the flower and fruit, very persistent.

An African genus, also found in Madagascar.

Flowers solitary.
- Shaggy, with spreading hairs . . . . . 1. *T. involucratum.*
- Strigose, with scattered appressed hairs . . . . . 2. *T. coronatum.*

Flowers capitate.
- Strigose, with scattered appressed hairs . . . . . 3. *T. Schumacheri.*
- Shaggy, with appressed hairs . . . . . 4. *T. hirtum.*

1. **T. involucratum,** *Benth. in Fl. Nigr.* 354. Procumbent, diffusely branched, crinite or hirsute with spreading or recurved, flexuous, stout hairs or bristles, especially on the branches. Leaves $1\frac{1}{2}$–3 in. by 1–$1\frac{1}{2}$ in., elliptic or elliptic-ovate or lanceolate, acuminate, quite entire, 5-nerved, hairs spreading on both surfaces, petioles slender, curved, $\frac{1}{3}$–1 in. densely crinite. Flowers solitary, subsessile, closely enveloped in 2–3 outer leafy and many inner obtuse, coriaceous bracts, which are bristly above the middle. Calyx $\frac{1}{3}$ in.; tube ovoid, with a broad ring of bristles about the middle; lobes 5, short, broadly ovate, obtuse or acute, ciliate. Petals obovate, $\frac{1}{2}$ in. long. Anthers $\frac{1}{8}$ in., nearly straight, connective shortly produced. Top of ovary strigose.—*Melast. involucrata,* Don, in Mem. Wern. Soc. iv. 290. DC. Prod. iii. 147.

Upper Guinea. Sierra Leone, *Afzelius! Don! Barter!* Fl. May.

2. **T. coronatum,** *Benth. in Fl. Nigr.* 354. Minutely rigidly strigose. Stem prostrate, and rooting at the base, ascending, 6–10 in. high, rigid, flexuous, terete and rough below with rigid, short, scattered bristles; branches acutely 4-angled, nodes with very rigid bristles. Leaves $2\frac{1}{2}$–3 in. by 1–$1\frac{1}{2}$ in., elliptic-ovate, acuminate, equally strigose on both surfaces, petiole $\frac{1}{4}$–$\frac{1}{3}$ in. Flowers solitary; outer bracts subfoliaceous, strigose, inner broadly oblong, more glabrous; calyx-tube (after flowering) $1\frac{1}{4}$ in. long, turgid, with 4–6 rings of stout appressed bristles; lobes short, triangular-ovate, acute, minutely ciliate.

Upper Guinea. "Maqueba," *Afzelius!* Sierra Leone, *Don!*

Very similar indeed to *T. Schumacheri*, but the flowers are solitary, the calyx has 4 distinct rings of bristles, and the 2 inner ribs of the leaf usually have the midrib a little above the 2 outer, which I find to be very rarely the case in *T. Schumacheri*. I have seen but few and poor specimens without flowers.

3. **T. Schumacheri,** *Guill. et Perr. Fl. Seneg.* 311. Erect; sparsely strigose with short, stiff, appressed bristles; branches acutely 4-angled. Leaves 4–6 in. by 2–$2\frac{1}{2}$ in., elliptic or elliptic-ovate or lanceolate, acute or acuminate, quite entire, equally sparsely strigose on both surfaces; petiole $\frac{1}{2}$–$\frac{3}{4}$ in. Flowers many in a subsessile head; outer bracts hardly foliaceous, not much exceeding the flower, very broad, strigose on the back; inner coriaceous, obovate, truncate, quite glabrous. Calyx $\frac{1}{3}$ in., tube ovoid, smooth or with a few bristles or with 1–3 rings of bristles; lobes very short, broadly ovate, obtuse or acute, very obscurely ciliolate. Petals $\frac{1}{4}$ in., white or pink; anthers $\frac{1}{8}$–$1\frac{1}{0}$ in.; connective very shortly produced. Crown of ovary bristly. Fruit dry or subbaccate.—*T. incompletum*, Br. in Tuckey's Congo, Append. 435.

Upper and Lower Guinea. Gambia, *Ingram!* Sierra Leone, *Afzelius! Vogel! Barter!* Senegambia, *Perrottet!* Gaboon, *Afzelius! Middleton!* Benguela, *Curror!* Congo, *Smith!*

Var. β. *littorale;* more lax, stems and branches more slender; outer bracts often foliaceous, calyx perfectly glabrous. *T. littorale*, Benth. in Fl. Nigr. 353.—Fernando Po, by the shore, *Vogel! Barter. Mann!* Princes' Island, *Barter!*

Var. γ. *albiflorum;* calyx with usually an incomplete ring of bristles; petals white (*Don*). *Melastoma albiflorum* Don, Gard. Dict. ii. 764.—Sierra Leone, *Don!*

4. **T. hirtum,** *Vent. Choix. Pl.* 35 (in note). Shrubby, 3–4 ft. high, hispid or hirsute with long, spreading, curled or straight, pale, stout hairs; branches stout, angles with short herbaceous wings. Leaves 4–6 in. by $\frac{1}{2}$–3 in., elliptic or elliptic-lanceolate, acute or acuminate, quite entire, 5-nerved, hairs scattered and appressed above, more copious and spreading beneath; petioles $\frac{1}{2}$–1 in., stout. Flowers crowded in globose, involucrate, terminal heads, sessile, $\frac{1}{2}$–$\frac{3}{4}$ in. diameter; outer bracts leafy, inner coriaceous, retuse. Calyx $\frac{3}{4}$ in.; tube with 3 membranous rings crowned by appressed bristles; lobes 5, triangular-lanceolate, acuminate, ciliate. Petals $\frac{1}{3}$ in., rose-coloured. Anthers $\frac{1}{4}$ in., all similar. Crown of ovary hemispheric, bristly.—Beauv. Fl. Ow. et Ben. i. 94, t. 57. Benth. in Fl. Nigr. 354.

Upper Guinea. *Beauvois.* Nun river, *Vogel! Barter!* Nupe and Lagos, *Barter!* Fernando Po, *Mann!* Fl. Dec.

7. **DISSOTIS,** Benth.; Benth. et Hook. f. Gen. Plant. i. 746.

Calyx-tube ovoid or campanulate, glabrous or clothed with scales, bristles, or stellately or pectinately spreading, sessile, or stipitate bristles; lobes 4–5, often bristly and alternating with bristly scales, deciduous or persistent. Petals 4–5, obovate. Stamens 8 or 10, very unequal; anthers linear-subulate, of the long stamens with an elongate arcuate connective appendaged or spurred at the base in front; anthers of small stamens with a short connective. Ovary 4–5-celled, adhering by 5 septa to the calyx-tube, top bristly; style curved; stigma simple. Capsule included in the coriaceous calyx-tube, top convex, bristly, 4–5-celled. Seeds minute, cochleate.—Herbs or shrubs, usually pubescent. Leaves ovate or oblong, 3–5-nerved. Flowers solitary capitate or panicled, usually large, rose-coloured, purple or violet.

A tropical and subtropical African genus.

§ 1. (**Heterotis**).— *Flowers 5-merous, enclosed in large sheathing persistent bracts. Calyx-lobes persistent.*

Flowers solitary or panicled; petiole short . . . . . 1. *D. segregata.*
Flowers 1–2, petiole long . . . . . 2. *D. petiolata.*
Flowers capitate.
  Calyx bristly round the middle of the tube . . . . . 3. *D. cornifolia.*
  Calyx covered with stellate or palmate bristles . . . . . 4. *D. Afzelii.*
  Calyx naked or bristly at the base only. Leaves with appressed hairs.
    Stem erect, white. Leaves sessile, narrow . . . . . 5. *D. theæfolia.*
    Stem green. Leaves short-petioled, ovate . . . . . 6. *D. capitata.*
    Stem prostrate. Leaves short-petioled, ovate . . . . . 7. *D. radicans.*
    Leaves covered with spreading hairs . . . . . 8. *D. hirsuta.*

§ 2. *Flowers crowded, 4-merous. Bracts small, persistent. Calyx-lobes persistent or subpersistent.*

Villous, with soft hairs . . . . . 9. *D. villosa.*
Scabrid . . . . . 10. *D. phæotricha.*

§ 3. *Flowers sub-solitary, 5-merous. Bracts 2, small, rarely large, deciduous. Calyx-lobes persistent.*

Calyx with scattered simple hairs . . . . . 11. *D. lævis.*
Calyx-tube glabrous, accessary lobes very long . . . . . 12. *D. antennina.*
Calyx with pedicelled stellately arranged bristles.
  Leaves broadly ovate, $\frac{1}{2}$–$\frac{3}{4}$ in. . . . . 13. *D. plumosa.*
  Leaves elliptic-ovate, $\frac{1}{3}$–$1\frac{1}{2}$ in. . . . . 14. *D. prostrata.*
Calyx-tube hoary with stellate or furfuraceous pubescence . . . 15. *D. incana.*

§ 4. *Flowers solitary racemose or panicled, 5-merous. Bracts deciduous. Calyx-lobes deciduous.*

Stem and leaves hirsute. Leaves subsessile, lanceolate . . . . 16. *D. Irvingiana.*
Stem and leaves scabrid. Leaves elliptic, shortly petioled . . . 17. *D. Melleri.*
Stem and leaves strigillose. Calyx-lobes obliquely dilated on one side . . . . . 18. *D. Barteri.*
Leaves villously pubescent, ovate, petioled.
  Flowers in stout panicles . . . . . 19. *D. eximia.*
  Stem hispid. Leaves short-petioled. Flowers racemose . . . 20. *D. grandiflora.*

1. **D.** (**Heterotis**) **segregata,** *Benth. in Fl. Nigr.* 350. Erect or suberect, shrubby below, strigose with short appressed bristles. Branches obtusely 4-gonous, copiously strigillose, nodes with long bristles. Leaves 2–4 in. by 1–1½ in., elliptic-ovate or ovate-lanceolate, acuminate, base acute or rounded, 3–5-nerved, rather copiously strigose on both surfaces; petiole ¼–⅓ in. Flowers 2 in. diameter, purple, 1–3 at the tips of the branches, shortly peduncled or subsessile, not in a head, each involucrate; outer bracts 2, narrow, small, foliaceous; inner 4, opposite, scarious, closely sheathing the calyx, obovate, truncate, glabrous, ciliate, smooth. Calyx ovoid, ⅓ in., bristly at the very base only; tube terete, smooth; mouth contracted; lobes half as long as the tube, lanceolate, ciliate, persistent. Petals broadly obovate. Anthers of long stamens nearly ⅓ in. Capsule glabrous, bristly at the tip only, 5-valved throughout its length.

Upper Guinea. Nun river, *Vogel!* Confluence of Niger, *Ansell!* Edges of swamps, Nupe, *Barter!*

In one specimen I find 8 stamens, with the connectives of the anthers all shortly produced, showing a transition to *Tristemma.*

2. **D.** (**Heterotis**) **petiolata,** *Hook. f.* Branches rather stout, erect, smooth, or with a very few short raised points, obscurely 4-gonous; nodes with 2–3 appressed bristles or 0. Leaves 4–6 in. by 2–2½ in., elliptic, subacute at both ends, 5-nerved, green and sparsely subscabrid, strigillose on both surfaces, most so above, paler below, with less distinct bristles; petiole ½–1½ in. Flowers solitary or 2-nate at the ends of the branches, sessile; outer bracts leafy, inner narrower, also green. Calyx-tube ½ in., quite smooth, glabrous, with a few bristles at the very base; lobes quarter the length of the tube, triangular-ovate, acuminate, obscurely ciliate, persistent. Anthers of long stamens ⅓ in., incurved, connective as long as the cells, stout; anthers of short stamens as long, with a very shortly produced connective. Capsule much shorter than the calyx-tube, 5-valved at the top with a minute apical ring of bristles.—*Tristemma,* sp., Thomson in appendix to Speke, Nile Journ. 635.

Nile Land. Madi, *Speke and Grant!* Fl. Dec.

Very similar to *D. capitata;* but leaves long-petioled, not at all ovate, with longer hairs on both surfaces, and very short calyx-lobes.

3. **D.** (**Heterotis**) **cornifolia,** *Benth. in Fl. Nigr.* 351. Subglabrous. Branches rather slender, obtusely 4-gonous, with long straight bristles at the joints and very few elsewhere. Leaves 3–4 in. by ¾–1¼ in., ovate-lanceolate, acute or acuminate, base acute or rounded, rigidly coriaceous, 5-nerved, both surfaces sparsely covered with very closely appressed bristles, those on the upper surface rough and partially immersed in the epidermis; petiole ⅛–⅙ in. Heads sessile, few-flowered; outer bracts foliaceous, inner ¾ in., scarious, obovate, with a ciliate keel. Calyx-tube ½ in., with a broad belt of bristles round the middle, sometimes reduced to a few bristles; lobes ovate-lanceolate, nearly as

long as the tube, acuminate, glabrous, not ciliate, persistent. Petals (young) orbicular, apiculate, red-purple. Capsule 5-valved, tip bristly.

Upper Guinea. Sierra Leone, *Afzelius!* Grand Bassa, *T. Vogel!*

4. **D. (Heterotis) Afzelii,** *Hook. f.* Branches stout, elongate, flexuous (climbing?), densely villous, more bristly at the nodes with spreading deflexed stiff and curled hairs. Leaves 2–2½ in. by 1–1¼ in., ovate, subacute, 5-nerved, quite entire, base rounded or cordate, upper surface sparsely clothed with appressed or spreading hairs, under surface hirsute; petiole ⅓–½ in. hirsute. Flowers 1–1½ in. in diameter, capitate, shortly pedicelled; outer bracts leafy, inner broadly ovate, equalling the calyx, subscarious, ciliate, persistent. Calyx-tube ovoid, ⅓ in., covered with simple or pedicelled stellately or palmately arranged bristles; lobes 5, ovate-lanceolate, half the length of the tube, ciliate, bristly at the tip and back, persistent. Petals large, broadly obovate. Anthers of long stamens ¼ in., equalling the connective, appendage clavate entire. Capsule sunk in the subcampanulate calyx-tube, which is ½ in. long, crown free, 5-valved, bristly at the tip.

Upper Guinea. Sierra Leone, *Afzelius!*

Habit of *Tristemma involucratum*, but calyx and anthers very different. Afzelius in a ms. note states the stamens to be 5, a point I cannot determine from his imperfect specimens.

5. **D. (Heterotis) theæfolia,** *Benth. in Fl. Nigr.* 351. A small pale shrub. Branches stout, white, obtusely 4-angled, scabrid with minute very distant short bristles; nodes with few long erect stiff bristles. Leaves subsessile, 1–2½ in. by ½–1 in., oblong-lanceolate or linear-oblong, obtuse or subacute, rigidly coriaceous, 3-nerved, equally sparsely strigillose and green on both surfaces. Heads many-flowered, sessile between the upper pair of leaves, 1–1½ in. in diameter in fruit; outer bracts foliaceous, scabrid; inner imbricate, very broad, truncate, hard and coriaceous, pale, quite smooth, edges membranous, persistent. Flowers sessile, 1½ in. in diameter, dull purple. Calyx-tube oblong, ½ in., smooth, glabrous, terete, base without bristles; lobes ovate-lanceolate, acute, membranous, half as long as the tube, persistent. Petals broadly obovate. Anthers of long stamens ⅓ in., connective nearly as long; connective of short stamens very short. Capsule membranous, nearly free, 5-valved at the tip, with an apical ring of bristles.

Upper Guinea. Sierra Leone, *Afzelius! Don!* Abbeokuta, *Irving!* Onitscha, *Barter!*

6. **D. (Heterotis) capitata,** *Benth. in Fl. Nigr.* 352. A small shrub. Stems robust, erect or weak and flexuous, diffusely branched, branches obtusely 4-angled, more or less scabrid; nodes with 1–2 short erect bristles. Leaves 3–5 in. by 1–2 in., ovate, acute, 5–7-nerved, sparsely strigose above, pale and nearly glabrous (with few microscopic hairs) beneath; petiole ⅙–¼ in. Heads few-flowered; outer bracts leafy, variable in size and shape; inner oblong, acute, membranous, crinite with long hairs towards the base, persistent. Calyx-tube ⅓ in.,

quite glabrous, except a few bristles at the very base; lobes lanceolate, acuminate, two-thirds as long as the tube, persistent, edges scarcely ciliate, back often scabrid. Petals broad. Anthers of long stamens upwards of $\frac{1}{3}$ in., connective nearly as long; connective of short stamens shortly produced. Capsule membranous, 5-valved, with an apical ring of bristles at the tip.—*Melastoma capitatum*, Don, Gard. Dict. ii. 764. *Melastomastrum erectum*, Naud. in Ann. Sc. Nat. sér. 3, xiii. 297. *Tristemma erectum*, Guill. et Perr. Fl. Seneg. 312.

Upper Guinea. Sierra Leone, *Afzelius! Don!* Senegambia, *Heudelot!*

Var. β. *Vogelii;* stems weak, flexuous, very sparingly scabrid at the angles chiefly.—*H. Vogelii*, Benth. l. c. 352.—Sierra Leone, *Afzelius! Vogel!*

Var. γ. *Barteri;* erect, robust, 4 feet high, stem and branches densely subhispidly strigose, hairs more copious on both surfaces of the leaf, not so appressed; petioles $\frac{1}{2}$ in.; calyx-lobes with long slender points; anthers rather smaller.—Nupe on the Niger, *Barter!*

Apparently a very variable plant. The Senegambian specimen is very imperfect, and has smaller flowers.

7. **D.** (**Heterotis**) **radicans,** *Hook. f.* Stem slender, flexuous, prostrate and rooting, much branched; branches ascending, flexuous, sparsely strigillose. Leaves $1\frac{1}{2}$–2 in. by $\frac{3}{4}$–1 in., ovate, obtuse or subacute, 5-nerved, strigillose with sparse appressed hairs on both surfaces, especially above; petiole $\frac{1}{10}$–$\frac{1}{6}$ in. Heads few-flowered; outer bracts leafy, usually very broadly ovate; inner as in *H. capitata*, but usually with longer crinite bristles at the base. Flowers and fruit as in *H. capitata* but about half the size.

Upper Guinea. Sierra Leone, *Afzelius!*

Very similar to *H. capitata*, var. *Vogelii*, but smaller in all its parts, prostrate and rooting; leaves more strigose beneath, of a reddish colour when dry.

8. **D.** (**Heterotis**) **hirsuta,** *Hook. f.* Hirsute with copious rather soft spreading hairs and bristles. Stem prostrate, flexuous, obtusely 4-angled, dark coloured; nodes with 1–2 straight appressed bristles. Leaves $1\frac{1}{2}$–2 in. by 1–$1\frac{1}{4}$ in., ovate, acute, 5-nerved, almost equally hirsute on both surfaces, green or reddish beneath; petiole $\frac{1}{4}$–$\frac{1}{2}$ in. Heads 3–6-flowered, sessile between the two uppermost leaves; outer bracts foliaceous; inner oblong; innermost linear, all ciliate. Flowers as in *D. capitata.*

Upper Guinea. Sierra Leone, *Afzelius! Barter!* Fl. May.

9. **D. villosa,** *Hook. f.* Stem erect from a short decumbent base, 6–18 in. high, terete, stout, villous with dense soft suberect hairs, sparingly branched, branches suberect. Leaves $1\frac{1}{2}$–2 in. by $\frac{1}{4}$–$\frac{1}{2}$ in., linear-oblong, obtuse or subacute, margins cartilaginous, obscurely serrate, 3-nerved, equally densely villous on both surfaces; petiole very stout. Flowers 4-merous, crowded between the two uppermost leaves in subcapitate corymbs, shortly pedicelled; bracts about equalling the pedicels, oblong, pectinate and villous, obtuse, persistent. Calyx-tube $\frac{1}{6}$ in., shortly campanulate, nearly glabrous below, armed at the top with 6–8 linear appendages stellately crowned with long bristles; lobes 4, $\frac{3}{4}$ as

long as the tube, rather membranous, oblong, obtuse, pectinate with long bristles, hardly deciduous; mouth thickened, contracted, 4-gonous, Petals $\frac{1}{3}$ in. long, purple, broadly obovate, bristle-pointed. Anthers of long stamens $\frac{1}{6}$ in., equalling the slender connective; appendage subclavate, flattened, truncate; connective of short stamens shortly produced, 2-tubercled in front. Capsule subglobose, with an apical crown of bristles and 4 subterminal valves.

Upper Guinea. Moist places, Nupe, *Barter!*

10. **D. phæotricha,** *Hook. f.* Stem 6–8 in., subsimple, erect or ascending from a short woody base, strigosely hispid, obtusely 4-angled. Leaves sessile, rather coriaceous, $1\frac{1}{2}$–2 in. by $\frac{1}{2}$–$\frac{2}{3}$ in., oblong or ovate-oblong, subacute, margin cartilaginous, obscurely serrate, 3–5-nerved, hispidly hairy on both surfaces. Flowers 4-merous, capitate between the uppermost leaves, very shortly pedicelled; bracts small, about equaling the pedicels, oblong, obtuse, membranous, pectinate with bristles. Calyx-tube subglobose, $\frac{1}{8}$ in., strigosely bristly, and with 6–8 appendages crowned with stellately arranged bristles round the mouth; lobes 4, ovate-oblong, obtuse, shorter than the tube, pectinate with long bristles, persistent; mouth contracted, thickened, 4-angled. Petals obovate, purple. Anthers of short stamens $\frac{1}{16}$ in., shorter than the connective, appendage short, 2-fid, connective of smaller stamens 2-tubercled at the base. Capsule subglobose, with an apical crown of bristles and 4 valves at the top.—*Osbeckia phæotricha,* Hochst. in Pl. Krauss.; Harv. et Sond. Fl. Cap. ii. 519.

Mozamb. Distr. Muata Manga, *Dr. Kirk!*

This solitary specimen differs slightly from the Natal ones, in the stem being scabrid chiefly at the angles, and the shorter bristles on the calyx-lobes and its appendages.

11. **D. (Heterotis) lævis,** *Benth. Fl. Nigr.* 348. Nearly glabrous. Stems 1–2 ft., procumbent, rooting; branches ascending, obtusely 4-gonous, flexuous, with a very few bristles here and there and some long straight ones at the nodes. Leaves long-petioled, membranous, $\frac{1}{2}$–$\frac{3}{4}$ in., orbicular-ovate, apiculate, glabrous or sparsely setose above, 3–nerved, ciliate on the margins and nerves beneath, petiole very slender, $\frac{1}{3}$–$\frac{1}{2}$ in. Flowers solitary, shortly peduncled, $\frac{1}{2}$–$\frac{3}{4}$ in. diameter; bracteoles 2, oblong, obtuse, ciliate, spreading $\frac{1}{8}$ in., subpersistent. Calyx-tube campanulate, $\frac{1}{4}$ in., sparsely laxly setose; lobes linear-lanceolate, as long as the tube, ciliate, persistent. Petals purple. Anthers of large stamens $\frac{1}{3}$ in., equalling the connective, appendage 2-fid; connectives of short stamens shortly produced, 2-tubercled. Capsule ovoid, crown setose, 5-valved at the top.

Upper Guinea. Nun river, *T. Vogel!*

12. **D. (Heterotis) antennina,** *Benth. in Fl. Nigr.* 349. Stem slender, decumbent, rooting, acutely 4-gonous, very sparingly ciliate, mottled with purple-brown; branches slender, flexuous, ascending; nodes bristly. Leaves 2–3 in. by $\frac{3}{4}$–$1\frac{1}{2}$ in., membranous, lanceolate or elliptic-lanceolate, acuminate at both ends, 5-nerved, hirsute on both

surfaces with rather spreading hairs; petioles $\frac{1}{4}$–$\frac{1}{2}$ in., flat, ciliate with copious rigid bristles $\frac{1}{4}$ in. long. Flowers solitary or 2–3, jointed on a very short peduncle; bracts as long as the calyx, very broad, membranous, crinite, deciduous. Calyx-tube $\frac{1}{4}$ in., broadly ovoid, glabrous, smooth; lobes as long as the tube, subulate-lanceolate, long acuminate, ciliate and bristle-pointed, persistent; accessory lobes 8–10, longer than the lobes, linear-subulate with very long spreading cilia. Petals not seen. Anthers of long stamens $\frac{1}{4}$ in., rather exceeding the prolonged connective; appendage clavate, entire; connectives of small anthers short, not spurred, appendage small. Capsule subglobose, crown bristly, 5-valved.

Upper Guinea. Sierra Leone, *Afzelius! Don!*

13. **D. (Heterotis) plumosa,** *Benth. in Fl. Nigr.* 348. Sparsely hirsute. Stems 1–2 ft., woody below, slender procumbent rooting; branches ascending, obtusely 4-gonous, with long spreading bristles at the nodes. Leaves membranous, $\frac{1}{3}$–$1\frac{1}{2}$ in. by $\frac{1}{3}$–$\frac{2}{3}$ in., broadly ovate or orbicular-ovate, obtuse or acute, 3-nerved, sparsely hirsute on both surfaces; petiole slender, $\frac{1}{3}$–$\frac{2}{3}$ in. Flowers solitary, shortly peduncled; bracts 2, membranous, broadly ovate, ciliate, 1–10th in., deciduous. Calyx-tube $\frac{1}{4}$ in., ovoid, thickly covered with long-stalked stellate purplish bristles, lobes linear-subulate, half as long as the tube, tipped with stellate bristles, persistent. Petals very broadly obovate, purple. Anthers of long stamens $\frac{1}{6}$–$\frac{1}{3}$ in., incurved, shorter than or equalling the prolonged connective, appendage 2-lobed; connective of small anthers shortly produced, obtusely spurred behind. Capsule ovoid, crown villous.—*Melastoma plumosa*, Don in Mem. Wern. Soc. iv. 291; DC. Prod. iii. 147. *Osbeckia rotundifolia*, Sm. in Rees Cycl. iii. 143.

Upper Guinea. Sierra Leone, *Afzelius! Vogel! Admiral Grey!* Accra, *Don!* Abbeokuta, *Irving!* On dripping rocks, Princes' Island, *Barter!*

14. **D. (Heterotis) prostrata,** *Benth. in Fl. Nigr.* 349. More or less hirsute or subglabrous. Stem 2–3 ft., rather stout, prostrate or climbing, sometimes rooting, flexuous, more or less hirsute with short or long flexuous stout hairs; nodes with spreading long bristles. Leaves $1\frac{1}{2}$–$2\frac{1}{2}$ in. by $\frac{3}{4}$–1 in., ovate or elliptic, subacute, 3-nerved, hirsute with straight rather appressed hairs on both surfaces; petiole $\frac{1}{3}$–$\frac{2}{3}$ in. Flowers solitary, $1\frac{1}{2}$ in. in diameter, shortly peduncled; bracts 2, $\frac{1}{10}$ in., membranous, ovate, long-ciliate, deciduous. Calyx-tube $\frac{1}{4}$ in., covered laxly with oblong or linear ciliate scales tipped by stellate bristles; lobes subulate-lanceolate, three-quarters as long as the tube, ciliate and tipped with stellate bristles, persistent. Petals very broadly obovate. Anthers as in *D. plumosa*. Capsule subglobose, crowned with bristles.—*Melastoma prostrata*, Schum. et Thonn. Pl. Guin. 220. *Lepidanthemum triplinervium*, Klotzsch in Peters' Mossamb. Bot. 64. An *Melastoma decumbens*, Beauv. Fl. Owar. i. 69, t. 41? *Osbeckia decumbens*, DC. Prod. iii. 143?

Upper Guinea. Quorra river at Patteh, *Vogel!* (A glabrous var.) Abbeokuta, *Irving!* (Moderately pubescent, petioles very short.)

Mozamb. Distr. Zanzibar, *Bojer! Grant! Kirk!* (An excessively hirsute

form.) Right bank of Luabo, and Moramballa, alt. 3500 ft., *Kirk!* (A small form, with glabrous calyx-tube.)

Closely allied to *D. plumosa*, but the leaves are not so large, nor nearly so broad, the petioles are shorter in comparison., and the calyx has shorter-stalked bristles.

15. **D. canescens,** *Hook. f.* Hoary with stellate pubescence. Stem 2–3 ft., purple, stout, erect, 4-angled, sparingly branched, branches erect; nodes with few small erect bristles. Leaves 2–3 in. by $\frac{1}{3}$–$\frac{1}{2}$ in., subsessile, coriaceous, linear or linear-oblong, obtuse, quite entire, 3-nerved, dark green above with scattered stellate hairs, whitish and densely puberulous beneath. Flowers 1–$1\frac{1}{2}$ in. in diameter, rose-purple, in subterminal leafy panicles with erect branches, crowded, shortly pedicelled; bracts equalling the calyx-tube, ovate, obtuse, membranous, purple. Calyx-tube $\frac{1}{4}$ in., hemispherical, covered with mealy or stellate pubescence, as are the 5 triangular-lanceolate acute persistent lobes, which equal the tube. Petals broadly obovate, ciliate at the tip. Anthers of long stamens $\frac{1}{6}$ in., equalling the connective, appendage clavate, notched; connective of short stamens not produced, 2-tubercled at the base. Capsule free, except at the angles, 5-valved to the base, crown hoary.—*Argyrella incana*, Naud. in Ann. Sc. Nat. sér. 3, xiii. 300. *Osbeckia canescens*, E. Mey. mss.; Graham in Bot. Mag. t. 3790. *O. Umluasiana*, Hochst. Pl. Krauss.; Harv. et Sond. Fl. Cap. ii. 518.

Nile Land. Moist places in the Ukidi forest, *Grant!*

Also a native of Natal. In cultivated specimens the leaves are 1 in. broad, and cordate at the base.

16. **D. Irvingiana,** *Hook. Bot. Mag.* t. 5149. Annual. Hirsute with copious pale spreading bristly hairs. Stem 1–3 ft., stout, erect, obtusely(branches acutely)4-angled, copiously 3-chotomously branched; nodes with spreading bristles $\frac{1}{4}$ in. long. Leaves 2–$3\frac{1}{2}$ in. by $\frac{1}{4}$–$\frac{2}{3}$ in., linear-oblong or oblong-lanceolate, acute, 3-nerved, sparsely substrigosely hairy on both surfaces, margin cartilaginous, obscurely serrate; petiole very short, setose. Flowers copious, 1–$1\frac{1}{4}$ in. in diameter, solitary or 2–5 in short axillary and terminal cymes; bracts 2, minute, orbicular, membranous, ciliate, deciduous. Calyx-tube $\frac{1}{4}$ in., subglobose, with a short cylindric apex, covered with scales crowned with stellately arranged or very long crinite bristles; lobes 5, half as long as the tube, ovate, subacute, very long-ciliate, deciduous. Petals obovate, red-purple. Anthers of long stamens $\frac{1}{8}$ in., shorter than the connective, appendage short, 2-lobed; connective of the smaller stamens very short, 2-tubercled. Capsule nearly free from the 10-ribbed calyx-tube, 5-valved at the tip, which is crowned with white bristles.

Upper Guinea. Abbeokuta, *Irving!* Nupe, on the Niger, in wet places, *Barter!*
Nile Land. Abyssinia, Tigre, *Schimper!* (n. 1437, coll. 1863–8.)

17. **D. Melleri,** *Hook. f.* A small shrub; branches woody, obscurely 4-gonous, deeply furrowed when dry; nodes much swollen, upper bristly. Leaves (the few remaining on the specimen) 1–$1\frac{1}{2}$ in., very rigidly coriaceous, shortly petioled, elliptic-lanceolate, subacute,

opaque, scabrid with short bristles, paler beneath; nerves 3–5, very stout below; petioles short, stout, scabrid. Flowers about $\frac{1}{2}$ in. in diameter, purple, crowded in short peduncled cymes in the upper axils, pedicels short, stout; bracts 0, or very early deciduous. Calyx-tube $\frac{1}{3}$ in., very coriaceous, cylindric-campanulate, covered with scattered flattened bristles which pass into short setose appressed simple or 2-fid scales below the mouth; lobes 5, broadly oblong, obtuse, apiculate, ciliate, deciduous. Petals (young) orbicular, glabrous. Anthers of large stamens $\frac{1}{3}$ in., as long as their connectives, appendage shortly produced in front, 2-lobed; connective of smaller anthers short, 2-auricled at the base. Ovary 10-ribbed, bristly at the very tip only; style stout, curved, stigma truncate.

Mozamb. Distr. Mount Chiradzura, alt. 2000 ft., on the Manganya range, *Meller!* (Sept. 1861.)

18. **D. Barteri,** *Hook. f.* Shrubby, sparsely strigillose with short appressed bristles; branches terete; branchlets obtusely 4-gonous. Leaves shortly petioled, 3–4 in. by $1\frac{1}{4}$–$1\frac{3}{4}$ in., oblong or elliptic or lanceolate-oblong, acute, base obtuse or rounded or subcordate, ciliate-serrulate, 3-nerved, equally minutely strigillose on both surfaces; petiole $\frac{1}{2}$ in. Flowers $2\frac{1}{2}$ in. in diameter, in terminal few-flowered paniculate cymes; peduncles short; pedicels strigillose. Calyx-tube $\frac{1}{2}$ in., ovoid, densely strigillose or hispid, and covered with stellately arranged bristles surrounded at the top by 5 erect appendages with stellately bristly tips; lobes 5, equalling the tube, strigillose at the back, very broad, large, deciduous, obcordate, with one lobe obliquely expanded into a membranous ascending wing, tip thickened and bristly. Petals very large, obovate, ciliate. Anthers $\frac{1}{2}$ in., linear-subulate, incurved, shorter than the very slender connective which is 2-spurred at the base in front; connectives of smaller stamens half as long as the anthers, 2-tubercled in front. Ovary-tip conic, deeply 5-lobed, hispid, crowned with 5 oblong hispid appendages; style slender, stigma truncate.

Upper Guinea. Prince's Island, *Barter!*

19. **D. eximia,** *Hook. f.* Shrubby, densely clothed with villous pubescence. Stem stout, woody, much branched, terete, obtusely 4-angled and branches furfuraceously pubescent with substellate scales and hairs. Leaves 3–5 in. by 1–$1\frac{1}{2}$ in., coriaceous, ovate or oblong-lanceolate, acute, often recurved, quite entire or crenulate, 5-nerved, base obtuse or cordate, equally densely appressedly villous on both surfaces, sometimes obscurely silky; petiole stout, $\frac{1}{2}$–1 in. Flowers in terminal stout branched panicles, 2–$2\frac{1}{2}$ in. in diameter, shortly pedicelled; bracts ovate or orbicular, acute or obtuse, shorter than the calyx, strigillose on the back, very deciduous. Calyx-tube $\frac{1}{2}$ in., broadly ovoid, hispidulous and densely clothed with long fascicled subappressed bristles; tip with elongated bristly appendages round the mouth; lobes as long as the tube, very variable, usually lanceolate, densely pubescent, bristly or not, deciduous. Petals broadly obovate,

purple. Anthers of long stamens $\frac{1}{2}$ in., equalling the connective, which is 2-spurred at the base in front; connectives of longer stamens half the length of the anther, also 2-spurred. Capsule subglobose; crown 5-valved, setose and with an apical crown of bristles.—*Osbeckia eximia*, Sond. in Linnæa, xxiii. 48; Harv. et Sond. Fl. Cap. ii. 518.

Nile Land. Ukidi Forest, *Grant!*
Mozamb. Distr. Manganya hills, alt. 3000 ft., *Meller! Kirk!*
Also a native of the Natal Colony.

20. **D. grandiflora,** *Benth. in Fl. Nigr.* 346. Stem 1–2 ft., ascending from a woody tuberous base, elongate, twiggy, sparingly branched and leafy, 4-gonous, hispid with spreading hairs. Leaves few, 2–3$\frac{1}{2}$ in. by $\frac{3}{4}$–1$\frac{1}{4}$ in., membranous, elliptic-oblong or lanceolate, acute at both ends, 3-nerved, with slender cartilaginous serrulate margins, equally softly sparsely hairy on both surfaces; petiole $\frac{1}{8}$–$\frac{1}{4}$ in., hispid. Flowers 2–3 in. in diameter, in terminal simple or branched long-peduncled few-flowered racemes, or 3-nate on slender axillary peduncles; bracts $\frac{1}{8}$ in., concave, suborbicular, membranous, ciliate, deciduous. Calyx-tube $\frac{1}{3}$–$\frac{2}{3}$ in., cylindric, sparsely covered with stipitate stellately or palmately arranged bristles, those round the mouth longer, otherwise glabrous; lobes linear-oblong, bristly, as long as the tube, tipped with a star of bristles, deciduous. Petals broadly triangular-obovate. Anthers of long stamens $\frac{1}{3}$–$\frac{1}{2}$ in., shorter than the very long connective, which is 2-spurred at the base; anthers of shorter stamens much smaller; connective short, slender, 2-tubercled in front. Style very long, slender. Capsule urceolate, crown strigose, 5-valved, tipped with a fascicle of bristles.—*Osbeckia grandiflora*, Sm. in Rees Cycl. xxv.; DC. Prod. iii. 143. *Melast. elongatum*, Don in Mem. Wern. Soc. iv. 291. DC. l.c. 147. *Osbeckiastrum Heudelotii*, Naud. in Ann. Sc. Nat. sér. 3, xiv. 119, and xiii. t. 7.

Upper Guinea. Sierra Leone, *Afzelius!* Senegambia, *Heudelot!*

8. **AMPHIBLEMMA,** Naud.; Benth. et Hook. f. Gen. Plant. i. 754.

Calyx-tube turbinate oblong or campanulate, produced beyond the ovary; limb dilated, membranous, 5-toothed, deciduous. Petals 5, oblong or obovate. Stamens 10, very unequal; longer anthers linear-subulate, connective elongate, arcuate, with an anticous appendage at the base, and sometimes a spur behind; shorter anthers with the connective rarely produced. Ovary 5-celled, top hollowed out, 5-angled, with 5 facets that have membranous margins. Capsule turbinate, 5-celled, 5-valved at the top, which is crowned by 5 flat scales. Seeds minute, obovoid; hilum basilar, raphe produced beyond the nucleus into a broad appendage.—Glabrous or pubescent tropical West African herbs or small shrubs. Leaves long-petioled, membranous, ovate, acuminate, serrulate, 5-nerved. Flowers in simple or branched scorpioid cymes; small or rather large.

Leaves sparsely hairy above, toothed. Calyx puberulous	1. *A. cymosum.*
Leaves, stems, and calyx densely pubescent	2. *A. molle.*
Leaves subglabrous, almost entire. Calyx setose	3. *A. setosum.*

1. **A. cymosum,** *Naud. in Ann. Sc. Nat. sér.* 3, xv. 51, *et* xiv. *t.* 7. *f.* 2. Herbaceous; branches and inflorescence puberulous or hoary. Stem stout, obtusely 4-gonous, glabrous. Leaves 3–7 in. by $1\frac{1}{2}$–4 in., ovate-cordate, acuminate, denticulate, 5–7-nerved, sparsely hairy above, still more sparsely beneath, nerves and transverse nerves slender, distant; petiole $\frac{1}{2}$–3 in. Flowers in small, spreading, panicled cymes, shortly pedicelled, $\frac{3}{4}$–1 in. diameter, rose-purple. Calyx $\frac{1}{3}$ in., obconic or funnel-shaped, 5-angled; lobes 5, short, triangular, obtuse, tips pubescent at the back. Petals elliptic-ovate. Anthers of long stamens $\frac{1}{4}$ in., incurved, equalling the connective, appendage clavate-lobed; anthers of short stamens much smaller, connectives shortly produced, 2-lobed at the base. Capsule urceolate, strongly reticulately ribbed.—Hook. Bot. Mag. t. 5473. *Melastoma cymosum,* Vent. Hort. Malm. t. 14; DC. Prod. iii. 147. *M. corymbosa,* Sims in Bot. Mag. t. 904. Don in Mem. Wern. Soc. iv. 292.

Upper Guinea. Sierra Leone, *Afzelius! Barter!*

2. **A. molle,** *Hook. f.* A small annual 6–10 in. high, softly pubescent all over with spreading, often purplish hairs. Stem flexuous, terete, sparingly branched. Leaves 2–$3\frac{1}{2}$ in. by $1\frac{1}{4}$–$1\frac{1}{2}$ in., ovate or ovate-cordate, subacute or obtusely acuminate, 3–5-nerved, obscurely denticulate, nerves obscure; petiole $\frac{1}{2}$–2 in. Flower $\frac{1}{3}$ in. diameter, in shortly peduncled unilateral cymes, subsessile. Calyx-tube $\frac{1}{6}$ in., subcampanulate, villous; lobes 5, subulate, about equalling the tube. Petals oblong, ciliate at the tip. Anthers of long stamens 1–12th in., longer than the stout connective, appendage short, 2-fid; anthers of smaller stamens rather shorter, but stouter; connective spurred behind at the base, and 2-tubercled in front.

Upper Guinea. Sierra del Crystal, Gaboon district, Fl. May. *Mann!*

3. **A. setosum,** *Hook. f.* Stem 6–10 in., slender, woody, terete, flexuous; branches obscurely 4-gonous, leaves beneath petioles and calyx minutely puberulous. Leaves $2\frac{1}{2}$–$3\frac{1}{2}$ in. by $1\frac{1}{2}$–2 in., membranous, ovate-cordate, acuminate, obscurely denticulate, 5-nerved, glabrous above with a very few scattered setæ, transverse nerves distinct; petiole very slender, 1–2 in. Flowers 1 in. diameter, in terminal, subsessile, few-flowered corymbs, shortly pedicelled. Calyx $\frac{1}{3}$ in., funnel-shaped, hoary, with a few spreading gland-tipped bristles; lobes very short, triangular. Petals oblong, margin with a few long gland-tipped hairs. Anthers of long stamens $\frac{1}{4}$ in., incurved, rather longer than the slender connective, appendage clavate; anthers of short stamens smaller; connective spurred behind, tumid in front.

Upper Guinea. Sierra del Crystal, in the Gaboon district, *Mann!* Fl. May.

9. **CALVOA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 755.

Calyx-tube turbinate or campanulate, produced beyond the ovary; limb truncate, deciduous, 5-toothed. Petals 5, obovate or oblong. Stamens 10 equal, or 5 smaller, suberect, anthers linear, pore single; connective shortly or not at all produced, dilated tubercled in front, not spurred behind. Ovary adherent, 3–5-celled, top concave, angled, smooth; style filiform, stigma obtuse. Capsule included in the coriaceous, campanulate, ribbed calyx-tube, surmounted by 3–5 depressed, scale-like facets, corresponding to as many cells and valves. Seeds minute, oblong or obovoid; hilum basilar, raphe much thickened, extended beyond the nucleus.—Herbs or small shrubs of tropical West Africa, often succulent; branches terete or 4-angled, with thickened nodes. Leaves long-petioled, ovate, 3–5-nerved. Flowers in scorpioid cymes, rather small, rosy.

Glabrous, succulent.	Leaves sinuate-toothed	1. *C. sinuata.*
Hoary, succulent?	Leaves sinuate-toothed	2. *C. crassinoda.*
Densely pubescent.	Leaves denticulate	3. *C. hirsuta.*

1. **C. sinuata,** *Hook. f.* Glabrous. Stem 2 ft., stout, 4-angled, simple or branched, nodes thickened. Leaves 2–3 in. by $1\frac{1}{2}$–2 in., succulent, ovate or suborbicular, cordate, recurved, obtusely acuminate, coarsely sinuate-toothed, 5–7-nerved; petiole slender, 1–2 in. Flowers rose-red, in simple or 2-fid scorpioid cymes, $\frac{3}{4}$–1 in. diameter, shortly pedicelled. Calyx-tube $\frac{1}{8}$–$\frac{1}{6}$ in., turbinate; limb dilated, obtusely 5-lobed. Petals broadly obovate, acuminate. Anthers 1–12th in., linear-oblong, incurved; connective shortly produced, dilated and 2-auricled at the base. Capsule $\frac{1}{3}$ in., turbinate-campanulate, coriaceous, 5-celled, strongly ribbed; scales level with the mouth of the calyx-tube.

Upper Guinea. Rocky islets near Prince's Island, *Barter!*
A very succulent plant, with difficulty analyzed, hence some allowance must be made for the description.

2. **C. crassinoda,** *Hook. f.* Minutely hoary-puberulous. Stem shrubby, erect, 5–6 ft., stout, terete; nodes close set, very much thickened and covered with thickened concave scars. Leaves $2\frac{1}{2}$–$3\frac{1}{2}$ in. by 1–$1\frac{1}{2}$ in., succulent, broadly elliptic-ovate, obtuse, obtusely sinuate-toothed, 3–5-nerved; petiole $\frac{1}{2}$–1 in., slender. Flowers in elongate, axillary and terminal, simple or forked, scorpioid cymes, shortly pedicelled. Calyx-tube $\frac{1}{4}$ in., narrowly campanulate; lobes 5, short, triangular, with a dorsal tubercle at the tip. Anthers linear-oblong; connective produced into a stout prolongation which bears a scutelliform disk at the middle in front. Capsule $\frac{1}{3}$ in., very strongly ribbed, 3-celled; scales level with the top of the calyx-tube.

Upper Guinea. St. Thomas's Island, on the top of the Peak, *Mann!* Specimen very imperfect.

3. **C. hirsuta,** *Hook. f.* A small branched annual herb, 6–8 in. high, hairy or hirsute, stem terete. Leaves $1\frac{1}{2}$–$2\frac{1}{2}$ in. by $\frac{3}{4}$–$1\frac{1}{4}$ in.,

membranous, ovate, subcordate, acute, obtusely denticulate, 5-nerved, hairs on both surfaces scattered, spreading; petiole $\frac{3}{4}$–$1\frac{1}{2}$ in. Flowers solitary or few in terminal corymbs, subsessile. Calyx-tube turbinate or obconic, strigose; limb sinuately 5-lobed. Petals broad. Anthers unequal, linear-oblong, obtuse; filaments short, flattened; connective not produced, dilated at the base. Capsule $\frac{1}{3}$ in., turbinate; scales projecting beyond the calyx-tube.

Upper Guinea. Fernando Po, at 6000 ft. elevation, *Mann!* Flowers very imperfect.

10. **SAKERSIA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 757.

Calyx-tube hemispheric or campanulate, smooth, glabrous; limb slightly dilated, obscurely 4- rarely 5-lobed, persistent. Petals 4 rarely 5, elliptic-oblong, obtuse, glabrous. Stamens 8, rarely 10, all equal and similar; filaments long; anthers linear-subulate, curved, connective much elongate, arcuate, with 2 narrow spheres in front at the base, and none behind. Ovary 4- rarely 5-celled, adherent to the calyx-tube by as many septa, crown minutely bristly; style filiform, stigma simple. Capsule enclosed in the coriaceous calyx-tube; crown smooth, hemispheric, 4- rarely 5-valved. Seeds very numerous, elongate, curved, angular, hilum basal; young, in one species crowned with cellular filaments, in the other naked.—Tropical West African shrubs or small trees; strigillose with rigid bristles. Leaves 3–5-nerved, scabrid. Flowers moderate-sized, in erect, pyramidal, terminal panicles; pedicels 2-bracteolate, bracteoles caducous.

Calyx-tube campanulate. Seeds appendiculate . . . . . 1. *S. africana.*
Calyx-tube hemispheric. Seeds not appendaged . . . . . 2. *S. echinulata.*

1. **S. africana,** *Hook. f.* A shrub or small tree, 20 ft. Branches obtusely 4-angled, together with the petioles, nerves of the leaf, and panicle substrigose with conical bristle-tipped tubercles; nodes with large bristles. Leaves 3–5 in. by $1\frac{1}{2}$–2 in., elliptic-oblong or lanceolate, acute, 3–5-nerved, obscurely serrulate, scabrid on both surfaces, transverse nerves distinct. Panicle ample, pyramidal, 6 in. long and broad. Flowers $\frac{1}{2}$ in. diameter, usually 4-merous, solitary or 3-nate, pedicels $\frac{1}{4}$–$\frac{1}{3}$ in., 2-bracteolate at the base; bracteoles 1–10th in., ovate, obtuse, concave, deciduous. Calyx-tube campanulate, $\frac{1}{4}$ in. Petals rose-coloured? Anthers $\frac{1}{4}$ in., longer than the connective; filaments as long as the anthers. Young seeds with 2–5 cellular hairs at the top.

Upper Guinea. Cameroons river, fl. Jan., *Mann!*

2. **S. echinulata,** *Hook. f.* Branches woody, robust, obtusely 4-gonous, strigose, with short stout bristles; nodes much thickened, with long appressed bristles. Leaves not seen. Panicle pyramidal, 3–5 in. long and broad; its peduncle stout, very short ($\frac{1}{2}$ in.), prickly, rachis and branches stout, terete, smooth, except at the principal nodes which are prickly. Flowers 4-merous, solitary or 3-nate, 1 in. in

diameter; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in., smooth; bracteoles deciduous. Calyx-tube hemispheric, $\frac{1}{4}$ in. in diameter. Petals $\frac{1}{2}$ in. long. Anthers nearly $\frac{1}{2}$ in., longer than their connective, equalling the filament. Seeds elongate, angular, curved, young without appendages.

Upper Guinea. Rio Pungas, Sierra Leone, *Afzelius!*
Clearly a species of *Sakersia*, though the young seeds want the curious cellular crests of *S. africana*.

11. **DICELLANDRA**, Hook. f.; Benth. et Hook. f. Gen. Pl. i. 757.

Calyx-tube turbinate, produced far beyond the ovary; limb shortly 5-toothed, persistent, teeth with minute accessory ones at the back. Petals 5, obovate, acuminate, glabrous. Stamens 10, unequal; anthers linear-subulate, pore single, larger curved, connective shortly produced with two spines before and one behind; connective of smaller anthers hardly produced. Ovary $\frac{1}{2}$-adherent, 5-celled, top conic 10-angled and winged, quite glabrous; style filiform, stigma obtuse. Berry 5-celled. Seeds curved, oblong, hilum basal, raphe much thickened and produced beyond the nucleus.—Tropical W. African herbs or shrubs, glabrous or furfuraceous. Leaves large, membranous, long-petioled, 3-7-nerved, denticulate. Flowers in small terminal pyramidal panicles.

Pubescence furfuraceous	1. *D. Barteri.*
Sparingly clothed with rigid bristles.	2. *D? setosa.*

1. **D. Barteri,** *Hook. f.* Epiphytic. Stem very stout, 10 ft. long, as thick as the thumb, spongy, rooting at the nodes, acutely 4-angled, hispidulous, especially at the angles; branches, petioles, young leaves, nerves beneath, and inflorescence covered with minute rusty furfuraceous pubescence. Leaves 6–10 in. by 4–7 in., elliptic-ovate or broadly ovate-cordate, acuminate, denticulate, transverse nerves distinct, quite glabrous above, purple beneath; petiole 3–8 in. Panicle 1–2 in. long; branches short; bracts minute, subulate. Flowers purple, 1 in. diameter, shortly pedicelled. Calyx-tube $\frac{1}{3}$ in. Petals $\frac{1}{2}$ in., membranous. Anthers of large stamens strongly falcate, $\frac{1}{3}$ in. Berry $\frac{1}{2}$ in. long.

Upper Guinea. Nun river, *Barter!* Fernando Po and Sierra del Crystal, on the Gaboon river, *Mann!*

2. **D.? setosa,** *Hook. f.* Branches obtuse, 4-angled, and petioles sparsely covered with rigid spreading bristles. Leaves 5-7 in. by $1\frac{1}{2}$–2 in., elliptic-lanceolate, acuminate, 3-nerved, glabrous on both surfaces, quite entire or obscurely denticulate, transverse nerves distinct; petiole 1–$1\frac{1}{2}$ in. Fruit in short terminal panicles, quite smooth, capsular, globose or very shortly urceolate, $\frac{1}{3}$ in. diameter; mouth of calyx contracted; top convex, 5-celled, with 5 small valves and a few terminal bristles. Seeds obpyramidal or cuneate, truncate, straight or curved, sides angled, hilum basilar, raphe thickened.

Upper Guinea. Sierra Leone, *Afzelius!*
A very doubtful plant as to genus.

12. **MEDINILLA,** Gaud.; Benth. et Hook. f. Gen. Pl. i. 759.

Calyx-tube ovoid campanulate or cylindric; limb entire or 4–5-toothed. Petals 4–5, usually acute, often fleshy. Stamens 8 or 10, equal or nearly so, anthers short or long, pore single, connective rarely produced, 2-lobed or spurred in front and usually behind also. Ovary more or less adherent, crown glabrous or puberulous; style short or long, stigma simple. Berry ovoid or globose, areolate at the top or crowned with the calyx-limb. Seeds minute, irregularly ovoid or angular; hilum basal, raphe often produced.—Erect or climbing shrubs of the tropics of the Old World, glabrous or pubescent, nodes often thickened. Leaves usually coriaceous or fleshy and quite entire. Flowers rarely large, in terminal or axillary cymes or panicles.

A large and polymorphous Asiatic genus, of which the prevalent characters are given above.

1. **M. (Diplogenia) Mannii,** *Hook. f.* A shrubby perfectly glabrous epiphyte, 4 ft. high; branches terete, woody, bark brown, nodes much thickened. Leaves subsessile, 3–5 in. by $\frac{3}{4}$–$1\frac{1}{4}$ in., coriaceous, narrowly ovate-lanceolate from a subcordate base, long acuminate, 3-nerved. Flowers $\frac{1}{3}$ in. diameter, in axillary 3–9-flowered, 3-chotomous cymes $\frac{1}{2}$ in. long, peduncles and pedicels slender, bracts minute, obtuse. Calyx turbinate, 1–10th in., limb membranous, dilated, entire, with 4 fleshy tubercles below the mouth outside, and a low thickened 4-angled cup or ring inside the mouth. Petals 4, white, obtuse. Stamens 8; anthers narrow oblong, connective not lengthened, with two suberect spurs in front at the base and one descending spur behind. Style slender. Berry spherical, $\frac{1}{6}$ in. diameter, green, 4-celled. Seeds sub-pyramidal.

Upper Guinea. Fernando Po, *Mann!*

13. **MEMECYLON,** Linn.; Benth. et Hook. f. Gen. Plant. i. 773.

Calyx broadly campanulate hemispheric or cupular; limb dilated, truncate, 4-toothed or lobed. Petals 4, broadly ovate obovate or orbicular. Stamens 8, equal, filaments filiform; anthers thick, consisting of a reniform, fleshy connective inserted by the convex (anterior) face, the lower end projecting behind like a thick blunt spur, the upper bearing 2 small anther-cells with longitudinal slits. Ovary wholly adherent, 1-celled, crown conic, flat or sunk, glabrous, often 8-ribbed, the ribs produced up the calyx-limb; style straight, slender, stigma simple; ovules 2–12, whorled round a central placenta. Berry ovoid or globose; testa thin or thick, 1- rarely 2-seeded. Seed large; cotyledons consolidated with the radicle or folded round it, crumpled or not.—Trees or shrubs usually perfectly glabrous. Leaves opposite, 3–5-nerved, when 3-nerved the two lateral are sometimes marginal or evanescent, quite entire, usually coriaceous. Flowers often violet, small or minute in subcorymbose bracteate panicles or fascicles; bracteoles

minute, at the base of the pedicel or under the flower. Berry small, black blue or purple.

A very large Asiatic, African, and especially Mauritian genus.

Leaves distinctly 3*-nerved.*

Inflorescence of sub-corymbose panicles.

Bracteoles fascicled or whorled at the bases of the pedicels.

Leaves 5–7 in. by 2–4 in. Panicle often terminal . . 1. *M. cæruleum.*
Leaves 3–4 in. by 1–2 in. Panicles axillary . . . 2. *M. Mannii.*

Bracteoles 2, opposite at the base of the calyx.

Leaves coriaceous, 2 lateral nerves not arching . . . 3. *M. Barteri.*
Leaves membranous, 2 lateral nerves arching . . . 4. *M. Vogelii.*

Inflorescence capitate on very short axillary peduncles.

Leaves membranous . . . . . 5. *M. membranifolium.*
Leaves coriaceous . . . . . 6. *M. fasciculare.*

Leaves penninerved.

Inflorescence capitate . . . . . 7. *M. virescens.*
Inflorescence panicled . . . . . 8. *M. polyanthemos.*
Inflorescence of peduncled fascicles . . . . . 9. *M. Donianum.*

1. **M. cæruleum,** *Guill. et Perr. Fl. Seneg.* 113, t. 71 (*Spathandra*). A large tree, trunk as thick as the thigh; branches densely leafy, stout; branchlets terete. Leaves 5–7 in. by $2\frac{1}{2}$–4 in., sessile, thickly coriaceous, brown or black when dry, broadly oblong or ovate-oblong or ovate-lanceolate, obtuse, acute or acuminate, base rounded or cordate, very opaque on both surfaces, ribs strong beneath, lateral nerves indistinct. Panicles terminal and axillary, corymbose, spreading, sometimes 4 in. in diameter, repeatedly umbellately branched; peduncles and branches strict, compressed and angled, hoary; pedicels $\frac{1}{8}$–$\frac{1}{6}$ in., 3-nate or umbelled; bracts whorled at the base of the pedicels, minute, ovate, subacute. Calyx $\frac{1}{8}$ in. in diameter, broadly turbinate, limb obscurely 4-toothed, 8-ribbed within. Petals broadly ovate, tips valvate. Ovules 8. Berry globose, $\frac{1}{3}$ in. in diameter, 1–2-seeded, flesh thin, testa crustaceous; cotyledons fleshy.—Naud. in. Ann. Sc. Nat. sér. 3, xviii. 263.

Upper Guinea. Sierra Leone, *Afzelius! Don! Vogel! Whitfield.* Senegambia, *Perrottet! Heudelot!* Bagroo river, *Mann!*

Var. β; leaves lucid, almost polished above.—Upper Guinea, Kongui river, *Mann!* fl. Sept.

2. **M. Mannii,** *Hook. f.* Shrubby; branches dark red-brown, as thick as a crowquill; branchlets terete. Leaves 3–4 in. by 1–2 in., thickly coriaceous, opaque, elliptic-ovate or oblong from a rounded base, subacute, similar and pale brown when dry on both surfaces, nerves 3, obscure on both surfaces, lateral nerves wholly obscured. Panicles axillary, spreading, corymbose, 2–3 in. in diameter, repeatedly umbellately branched, branches and peduncles strict, slender, terete, hoary; pedicels slender, 3-nate or umbelled; bracts at the bases of the pedicels minute, ovate, subacute. Calyx 1–12th in. in diameter, campanulate; limb 4-toothed; 8-costate inside. Petals triangular-ovate, tips valvate. Ovules 4–6. Berry $\frac{1}{4}$ in. in diameter, globose, flesh thin, testa crustaceous, cotyledons crumpled.

Upper Guinea. Gaboon river, fl. July, *Mann!*
Much smaller than *M. cæruleum*, with the nerves of the leaves very obscure.

3. **M. Barteri,** *Hook. f.* A shrub 8 ft. high; branches greyish-white, about as thick as a crow-quill; branchlets terete. Leaves petioled, $2\frac{1}{2}$–$3\frac{1}{2}$ in. by $1\frac{1}{4}$–$1\frac{1}{2}$ in., coriaceous, elliptic, acuminate at both ends, most so at the apex, olive-brown when dry, almost lucid on both surfaces, nerves 3, slender, distinct; transverse nerves very obscure; petiole $\frac{1}{4}$ in. Inflorescence perfectly glabrous, of numerous small axillary corymbose solitary or fascicled panicles $\frac{1}{3}$ in. long and broad, sparingly subumbellately branched. Calyx subhemispheric, 2-bracteolate at the base, $1\frac{1}{4}$ in. in diameter, bracteoles small, suborbicular, concave; limb broadly 4-lobed, lobes rounded, not costate inside. Petals orbicular, tips imbricate. Ovules 2. Fruit not seen.

Upper Guinea. Lagos, *Barter!*

4. **M. Vogelii,** *Naud. in Ann. Sc. Nat. sér.* 3, xviii. 263. A shrub, 6–10 ft. Branches rather slender, bark whitish, of the branchlets red-brown, 4-angled. Leaves shortly petioled, 4–8 in. by $2\frac{1}{2}$–4 in., rather membranous, ovate suborbicular elliptic-oblong or lanceolate, subacute or gradually acuminate, base acute rounded or subcordate, olive-green and lucid with the 3 main and few distant transverse nerves distinct on both surfaces, 2 outer nerves arched between the junctions of the transverse; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. Inflorescence quite glabrous of small single or geminate axillary shortly peduncled corymbose few-flowered panicles $\frac{1}{2}$ in. diameter; peduncle and branches compressed, acutely angled; bracteoles deciduous, whorled at the base of the slender subumbellate pedicels. Calyx $\frac{1}{8}$ in. diameter, broadly campanulate, limb large, quite entire, 8-costate inside. Petals broadly ovate, tips valvate. Ovules numerous. Berry ovoid, $\frac{1}{3}$–$\frac{1}{2}$ in. long, crowned by the broadly 4-lobed calyx-limb; pedicel $\frac{1}{4}$–$\frac{1}{2}$ in. Testa thin; cotyledons crumpled?—*Spathandra memecyloides*, Benth. in Fl. Nigr. 357.

Upper Guinea. Sierra Leone, *Afzelius!* Prince's Island and Fernando Po, *Barter!* Old Calabar, *Mann!* fl. Feb.

5. **M. membranifolium,** *Hook. f.* A shrub, 8–10 ft.; branches slender, bark white, of the acutely 4-angled branchlets red-brown. Leaves shortly petioled, 3–5 in. by $1\frac{1}{4}$–2 in., very membranous, elliptic-ovate or lanceolate, suddenly narrowed to a rather broad obtuse apiculate point, base acute, sublucid, pale green on both surfaces, nerves very distinct, 2 lateral subarching, transverse few, distant; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. Flowers few, minute, sessile, clustered on very short axillary peduncles; bracteoles minute, ovate, acute, concave, keeled, persistent at the base of the calyx. Calyx broadly obconic, 1–10th in., purple; lobes 4, broadly ovate, obtuse; tip of ovary 8-costate. Petals broadly obovate, violet. Filaments longer than the petals, slender. Ovules 4. Berry ovoid, $\frac{1}{2}$ in. long, crowned with the minute unchanged calyx-limb, flesh thin. Testa crustaceous; endopleura thin; cotyledons apparently consolidated with the radicle, surface ruminate.

Upper Guinea. Fernando Po and Ambas Bay, *Mann!*

6. **M. fasciculare,** *Planch. in Fl. Nigr.* 357 (*Spathandra*). Branches rather slender; branchlets terete. Leaves shortly petioled, 3–4 in. by $1\frac{1}{2}$–2 in., rigidly coriaceous, red-brown when dry, elliptic-ovate or lanceolate, obtuse or abruptly contracted into an obtuse point, lucid on both surfaces, nerves very distinct, 2 outer not arching, transverse many with distinctly reticulated areolæ; petiole $\frac{1}{6}$–$\frac{1}{4}$ in. Inflorescence glabrous of minute flowers clustered on very short axillary peduncles; pedicels short, bracteolate at the base, bracteoles minute crowded, persistent, orbicular, concave, obtuse or mucronate. Calyx 1–10th in. diameter, tube obovoid or obconic, expanding into a broad concave 6-lobed limb, lobes rounded, inside not ribbed. Petals obovate, spathulate. Filaments long, slender. Berry $\frac{1}{4}$ in. diameter, globose or broadly pyriform, flesh thin. Testa coriaceous; cotyledons folded, convolute.—*M. Heudelotii,* Naud. in Ann. Sc. Nat. sér. 3, xviii. 265.

Upper Guinea. Senegambia, *Heudelot!* Sierra Leone, *Afzelius! Don!*

7. **M. virescens,** *Hook. f.* Branches slender. Leaves shortly petioled, 5–6 in. by $2\frac{1}{2}$–3 in., rather coriaceous, pale green on both surfaces, elliptic-oblong, acuminate, penninerved, base acute, lucid above, nerves above very indistinct, beneath costa distinct, lateral nerves few, indistinct, distant, nearly horizontal, uniting in an intra-marginal equally faint one; petiole $\frac{1}{8}$ in. Flowers clustered on very short axillary glabrous peduncles, green; pedicels short, glabrous; bracteoles clustered at their bases, suborbicular concave persistent. Calyx hemispheric; limb membranous, hardly lobed, inside 8-ribbed, ribs in pairs. Petals transversely oblong, broadly imbricate with very broad bases. Filaments apparently short. Ovules 4 in a depressed cell.

Upper Guinea. Gaboon river, *Mann!*—I have but one specimen, and that in bud only.

8. **M. polyanthemos,** *Hook. f.* A shrub; branches trichotomous, slender. Leaves petioled, 2–4 in. by $1\frac{1}{2}$–2 in., thickly coriaceous, lurid greenish or brown, sublucid on both surfaces, elliptic, base acute, apex suddenly contracted to a long broad acute point, penninerved, nerves very indistinct or evanescent on both surfaces, lateral nearly horizontal. Flowers in numerous axillary solitary or fascicled corymbose many-flowered panicles $\frac{1}{2}$–$1\frac{1}{2}$ in. long and broad, peduncles and branches subumbellate compressed and angled, quite glabrous; bracteoles crowded at the base of the subumbellate slender pedicels, deciduous. Calyx 1–10th in. diameter, tube turbinate; limb large, obscurely 4-toothed, 8-winged inside, wings approaching in pairs. Petals broadly ovate, tips valvate. Filaments short. Ovules 8. Berry $\frac{1}{3}$ in., broadly ovoid; flesh thin, testa rather membranous, cotyledons crumpled.

Upper Guinea. Sierra Leone, *Afzelius!* Bagroo river, *Mann!* fl. April.

9. **M. Donianum,** *Planch. in Fl. Nigr.* 357. Branches rather stout. Leaves 4–6 in. by 2–$2\frac{1}{2}$ in., very thickly rigidly coriaceous, elliptic-oblong, abruptly acuminate, base acute, polished and red-brown when

dry on both surfaces, penninerved, midrib distinct, lateral nerves very numerous, horizontal, very obscure above, invisible beneath. Inflorescence axillary, of apparently many flowers crowded on a very short stout peduncle. Flowers wanting. Berry on a stout curved pedicel which has the scars of fallen bracteoles at the base, $\frac{1}{2}$–$\frac{3}{4}$ in. diameter, globose, crowned with the calyx-limb, 1–2-seeded. Testa crustaceous; cotyledons excessively irregularly plaited; radicle thick, incurved, fleshy next the hilum.—*Pavetta lateriflora*, Don, Gard. Dict. iii. 575.

Upper Guinea. Sierra Leone, *Don!*

Order LVIII. LYTHRACEÆ. (By Mr. W. P. Hiern.)

Calyx-tube campanulate cylindrical or hemispherical, sometimes whitish or coloured, having an oblique mouth in *Woodfordia* alone; calyx-lobes 4–8, deltoid or lanceolate, valvate in æstivation, and in many genera with as many intermediate (usually) exterior teeth or cornua. Petals usually isomerous and alternate with the calyx-lobes, obovate, often corrugated in the bud, sometimes wanting, deciduous or persistent, inserted around the top of the interior of the calyx-tube. Stamens usually definite, inserted on the interior of the calyx-tube, declinate in *Woodfordia* alone; filaments inflected in the bud; anthers 2-celled, introrse and versatile except in *Olinia*, dehiscing by longitudinal parallel fissures. Ovary free, except in anomalous genera, sessile or very shortly stipitate, usually 2–4-celled; cells with many anatropous ovules attached to a central placenta, except in anomalous genera; style simple, persistent; stigma usually capitate, sometimes punctiform or 2-lobed. Fruit 2–4- or many-celled or by obliteration of septa 1-celled, usually capsular and valvular or with circumscissile or irregular dehiscence. Seeds usually numerous, exalbuminous; embryo straight or slightly curved except in *Olinia*; radicle short.—Herbs, shrubs or trees, terrestrial subaquatic or even aquatic. Leaves simple, entire, usually opposite, occasionally verticillate or alternate, exstipulate, equal at the base. Flowers hermaphrodite, solitary racemose cymose or panicled, usually axillary, bracteate, sometimes dimorphous or trimorphous.

A considerable Family, inhabiting for the most part the Tropics of both hemispheres; a few of them are found in temperate latitudes. Five small genera are limited to Africa.

Ovary free. Fruit capsular.

Herbs.

Calyx tubular. Ovary 2-celled	1. Lythrum.
Calyx campanulate (or, if tubular, with a 4-celled ovary).	
Flowers sessile or subsessile, usually solitary	2. Rotala.
Flowers racemose	3. Rhyacophila.
Flowers cymose or capitate.	
Petals corrugated in bud. Capsule valvular	4. Nesæa.
Petals not corrugated in bud. Capsule with circumsciss or irregular dehiscence	5. Ammannia.

Shrubs or trees.
Capsule valvular. Calyx with oblique mouth. Stamens declinate . . . . . 6. WOODFORDIA.
Capsule bursting transversely. Calyx straight. Stamens not declinate.
Flowers hexamerous. Capsule scarcely exceeding the cornuate infundibuliform calyx . . . . . 7. PEMPHIS.
Flowers tetramerous. Capsule much exceeding the non-cornuate spreading calyx . . . . . 8. LAWSONIA..
Ovary more or less adherent to the calyx-tube. Fruit drupaceous or baccate. (Anomalous genera.)
Stamens very numerous. Flowers 6–7-merous . . . . . 9. SONNERATIA.
Stamens definite. Flowers 4–5-merous.
Ovary 1-celled, 1–2-ovuled. Stamens 8 or 10 . . . . . 10. STREPHONEMA.
Ovary 3–5-celled; cells few-ovuled. Stamens 5 . . . . . 11. OLINIA.

1. **LYTHRUM**, Linn.; Benth. et Hook. f. Gen. Plant. i. 779.

Calyx tubular with 4 cornua and deltoid lobes; petals opposite the cornua, corrugated in bud; stamens 2 or 8; stigma capitate; ovary free, sessile, 2-celled, with ovules arranged in 4 longitudinal rows on the thick placenta. Capsule included in the calyx, 2-celled, dehiscing septicidally; seeds many, small.—Glabrous herbs with entire, opposite, or alternate leaves, and solitary, axillary, subsessile flowers.

A genus of a few species; occurs in most parts of the world.

Stamens 2. Leaves narrow, alternate. Cornua longer than the calyx-lobes . . . . . 1. *L. Thymifolia.*
Stamens 8. Leaves round, opposite. Cornua very short . . 2. *L. rotundifolium.*

1. **L. Thymifolia,** *Linn.; DC. Prod.* iii. 81. Stem prostrate or procumbent, terete, with angular branches, 2–24 in. long. Leaves alternate, linear, the lower ones oblong-lanceolate acute, not more than $\frac{1}{2}$–1 in. long. Bracts deciduous, linear, shorter than the calyx. Calyx narrowly tubular, 8-veined, the 4 stronger veins proceeding to the cornua; calyx-lobes shorter than the cornua. Petals ligulate or obovate. Stamens 2, opposite, not exceeding the calyx-tube, and inserted at a third above its base. Ovary oblong, equalling the erect style which reaches to the level of the stamens. Capsule oblong, subquadrangular.

Nile Land. In damp places, Abyssinia, *Schimper!*
Widely distributed.

2. **L. rotundifolium,** *Hochst. in A. Rich. Fl. Abyss.* i. 280. Stem creeping, terete, rubicund, with short, ascending branches, 3 in. long. Leaves opposite, very shortly stalked, round-oval, $\frac{1}{4}$–$\frac{1}{3}$ in. long, exceeding the calyx. Calyx with wide, 8-veined, scarcely ribbed tube, depresso-deltoid mucronate lobes, and very short cornua; cylindrical in fruit. Petals long, unguiculate. Stamens 8, exserted; those opposite the calyx-lobes the longer. Ovary narrowly ovoid, gradually narrowing into the short thick style.—According to Hochstetter the flowers are pentamerous.

Nile Land. By streams and in swamps, Abyssinia, *Schimper!*

2. ROTALA, *Linn. Mant.* 175.

Calyx campanulate or rarely tubular, usually hemispherical in fruit, 4- rarely 5-lobed, in one species with intermediate acicular cornua, usually not accrescent. Petals as many as calyx-lobes or 0, usually minute, obovate, not corrugated in the bud. Stamens 1–5 usually 4, not more numerous than the calyx-lobes; filaments filiform. Ovary 1–4-celled, free, many-ovuled, sessile; style short or long, filiform; stigma capitate. Capsule 2–4-valved, many-seeded, usually exceeding the calyx-tube; placenta usually compressed; seeds numerous; embryo straight with short radicle.—Glabrous herbs growing in wet places or even in water. Leaves opposite or verticillate, flat; flowers axillary, sessile or subsessile, solitary or few together, bibracteate, in *R. nummularia* (and perhaps in other species) dimorphous.

Scattered over the Tropics of the whole world.

Flowers solitary.
- Calyx whitish, scarious (or sometimes purplish in *R. filiformis*).
  - Capsule 4-valved.
    - Calyx tubular, accrescent . . . . . 1. *R. elatinoides.*
    - Calyx campanulate, not accrescent . . . . . 2. *R. tenella.*
  - Capsule 3-valved.
    - Flowers pentamerous; leaves more or less whorled . . 3. *R. verticillaris.*
    - Flowers tetramerous; leaves always opposite.
      - Calyx cornuate . . . . . 4. *R. decussata.*
      - Calyx not cornuate . . . . . 5. *R. stagnina.*
  - Capsule 2-valved. Stamens 2 . . . . . 6. *R. filiformis.*

Calyx rose-coloured, membranous. Stamens 4. (*Mirkooa.*)
- Leaves opposite.
  - Petals small; capsule 2-valved . . . . . 7. *R. fontinalis.*
  - Petals large; capsule 4-valved . . . . . 8. *R. nummularia.*
- Leaves whorled . . . . . 9. *R. myriophylloides.*

Flowers 1–4 together . . . . . 10. *R. serpiculoides.*

1. **R. elatinoides,** *Hiern.* Annual, ascending, nearly simple, slender, subterete, rooting at the base, 2–4 in. high. Leaves ovate-oblong, decussate, subsessile, the upper ones sessile shorter and cordate or subcordate at base, $\frac{1}{5}$–$\frac{1}{2}$ in. long; lower internodes longer than the leaves. Flowers solitary, subsessile in the axils of upper leaves, each with 2 subulate bracts at base. Calyx at first campanulate, cylindrical and accrescent in fruit, semipellucid, 8-veined, 4-lobed, not cornuate; lobes $\frac{1}{4}$–$\frac{1}{5}$ of the length of the calyx, deltoid or lanceolate, acute. Petals 4, oblong, violet or white, marked with reddish midrib, rather exceeding the calyx-lobes. Stamens 2 or 4, inserted below middle of calyx-tube, about equalling the calyx-tube. Ovary 4-sulcate, 4-celled, ovoid, sessile, without hypogynous disk; style very short, or stigma subsessile. Capsule tubular, 4-celled, dehiscing by 4 valves septifragally, enclosed in the persistent calyx; placenta slender, tetragonal; seeds concave on one side, convex on the other.—*Ammannia elatinoides,* DC. Monogr. Lyth. 28, t. iii. B. *Ameletia elatinoides,* Bl. Mus. Bot. ii. 136.

Upper Guinea. Senegal, fl. September to February, *Perrottet!* fl. January, *Roger! Bidjem!*

Grows in low inundated places.

2. **R. tenella,** *Hiern.* Stem low, creeping at base and rooting, scarcely 3 in. long. Leaves sessile, amplexicaul, obscurely veined, ovate-oblong, rounded at apex. Flowers minute, subsessile. Calyx campanulate or hemispherical, with 4 acute deltoid lobes, not accrescent nor cornuate. Petals white, scarcely exceeding the calyx, very deciduous. Stamens 4, included, inserted above the base of the calyx; filaments concealed in the longitudinal depressions of the ovary. Ovary ovoid, 4-sulcate, 4-celled; style short. Capsule globose, dehiscing at the apex by 4 valves, enclosed in the persistent calyx. Seeds somewhat concave on one side, convex on the other.—*Ammannia tenella,* Guill. et Perr. Fl. Seneg. i. 297. *Ameletia tenella,* Bl. Mus. Bot. ii. 136.

Upper Guinea. Senegal, *Perrottet!* fl. Sept. and Oct.

3. **R. verticillaris,** *Linn.; DC. Prod.* iii. 76; *Wight. Ic.* ii. t. 260. Prostrate, rooting and branched at the base, 1–4 in. long. Leaves 3 or 4 in a whorl, or in var. β often opposite, linear or subulate, 1-veined, spreading, 1–4 in. long. Bracts subulate. Calyx campanulate, small, scarious, with 5 deltoid acute short lobes, not accrescent, without cornua. Petals wanting or caducous. Stamens 3–5 (?), arising from the base of the calyx-tube and exserted. Ovary 3-celled, or 1-celled by abortion of the thin septa; stigma subsessile. Capsule dehiscing by 3 valves from apex.—*Ammannia Rotala,* F. Muell. Fragm. iii. 108.

. Scattered over the tropics of the whole world.

Var. β. *Spruceana.* Leaves usually opposite, occasionally 3 in a whorl, subulate. Plant small. *Hypobrichia Spruceana,* Benth. in Hb. Spruce; cf. *R. pusilla,* Tul. in Ann. Sc. Nat. sér. 4, vi. 128 (1856).

Upper Guinea. Niger, *Barter!*

Lower Guinea. Angola, Pungo Andongo, 2400–3800 ft. alt., fl. and fr. March. (Var. β.) *Dr. Welwitsch!*

4. **R. decussata,** *DC. Prod.* iii. 76. Much branched, 1½–9 in. long, usually spreading. Leaves elliptic oblong or linear, varying according to dampness of locality, narrowed or rounded at the base, sessile or subsessile, blunt, spreading, $\frac{1}{10}$–$\frac{1}{2}$ in. long. Bracts subulate at base of calyx. Flowers sessile, solitary. Calyx scarious, with 4 deltoid lobes and longer aristate caducous cornua, not accrescent. Petals 4 or 0. Stamens 4 (?), equalling the calyx. Ovary 3-celled; style short. Capsule 3-valved, exceeding and tearing the calyx; placenta compressed, 3-winged.—*Rotala Roxburghiana,* Wight. Ic. t. 260, var. *Ammannia nana,* Roxb. Fl. Ind. i. 427. *A. illecebroides,* Arn. in Wight. Hb. 2317. *A. pentandra,* Roxb. Fl. Ind. i. 427, var.

Lower Guinea. Angola, Pungo Andongo, 2400–3800 ft. alt., fl. and fr. March, *Dr Welwitsch!*

Occurs also in India and Australia.

5. **R. stagnina,** *Hiern.* Stem simple or subsimple, erect, about 4 in. high, rooting at base, quadrangular. Leaves ovate-oblong, blunt

at apex, subcordate or subauricled at base, subsessile, spreading, 2 in. long. Flowers sessile, with minute linear bracts. Calyx scarious, with ovate-oblong tube and 4 ovate-lanceolate acute lobes, not cornuate nor accrescent, early lacerated by dehiscence of valves of capsule. Petals wanting or caducous. Stamens 2, arising from near base of calycine tube and rather shorter than the calyx. Style short. Capsule 3-valved, dehiscing widely.—*Ammannia elatinoides*, Hb. Schimp. Abyss. 9, ii. n. 1187 ! (non DC.)

Nile Land. Abyssinia, in marshes, *Schimper !*

6. **R. filiformis,** *Hiern.* A cæspitose annual, with erect or ascending simple or branched leafy quadrangular stems, 1–6 in. high. Leaves varying from ovate to linear-subulate, blunt, decussate, spreading, 1–8 lines long, not exceeding 1 line in width, subsessile and subcordate; internodes shortening upwards. Flowers solitary and subsessile in the axils of all the leaves except near the base of the plant; bracts lateral, subulate at the base of the calyx. Calyx campanulate, with 4 rather short deltoid acute lobes, tender, not cornuate nor accrescent, sometimes purplish. Petals 0 or scarcely any. Stamens 2, lateral, included in the calyx-tube and inserted near its middle. Style short; ovary included, 2-celled. Capsule 2-valved, exceeding the calyx, at length dark purple; embryo straight.—*Suffrenia filiformis*, Bell; DC. Prod. iii. 76; *S. capensis*, Harv. Thes. Cap. ii. 56, t. 189.

Lower Guinea. Benguela, Huilla, *Dr. Welwitsch !* Angola, Pungo Andongo, 2400–3800 ft. alt., fl. and fr. March, *Dr. Welwitsch !*

South Central. Island near Victoria Falls, *Kirk !*

7. **R. fontinalis,** *Hiern.* An erect or ascending simple or branched annual or perennial, 2–7 in. high. Stem quadrangular, rooting, and often creeping at the base, leafy. Leaves oval, subsessile, rounded at the apex, decussate, often wider towards the base and broadly cordate, not exceeding $\frac{1}{3}$ in. long, the upper ones imbricating, the rest patent; lower internodes longer than the leaves, upper ones shorter. Flowers solitary and sessile in the crowded axils of the upper leaves, with 2 lateral small subulate bracts at the base of the calyx. Calyx campanulate with 4 deltoid lobes of a deep rose colour and without cornua, not accrescent. Petals 4, small, caducous. Stamens 4, exceeding the calyx-tube. Ovary ellipsoidal, 2-celled, included in the calyx-tube; style exceeding the calyx. Capsule 2-valved, exceeding the calyx-tube, dehiscing septifragally. Seeds ovoid, concave on one side, convex on the other; embryo with short radicle, slightly curved in an accumbent manner.

Lower Guinea. Congo, *Chr. Smith !* Angola, Pungo Andongo, 2400–3800 ft. alt., fl. and fr. March, *Dr. Welwitsch !*

8. **R. nummularia,** *Welw. mss.* Perennial, glaucous-green, rather fleshy. Stems erect or ascending, crowded, simple or branched, 1–7 in. high, leafy. Leaves decussate, elliptic roundly ovate or subrotund, the broader ones cordate and sessile or floral ones smaller subcordate

and subsessile, less than $\frac{1}{2}$ in. long; lower internodes longer than the leaves, the upper ones shorter. Flowers solitary in the crowded axils of upper leaves, of a bright rose colour with 2 opposite and lateral linear acute membranous bracts at base of calyx and exceeding its tube; dimorphous according to the comparative length of the stamens and style. Peduncles very short, adnate to the base of the leaves. Calyx campanulate, rose-coloured, 4-fid, not cornuate; lobes deltoid, acute. Petals 4, twice the length of the calyx-tube, obovate, shortly clawed, persistent, not crumpled in the bud. Stamens 4, about length of calyx or much exserted, inserted near base of calyx-tube. Ovary enclosed in calyx-tube, 4-lobed, 4-celled, sessile; style long and tortuous or about length of calyx according as the stamens are short or long; stigma subcapitate. Capsule 4-valved at least at apex, ultimately 1-celled, very shortly-stalked.

Lower Guinea. Angola, Huilla, 3800–5500 ft. alt., fl. January and October, *Dr. Welwitsch!*

9. **R. myriophylloides,** *Welw. mss.* Aquatic, stoloniferous, with creeping rhizome, cæspitose. Stems erect, numerous, simple or slightly branched near the ends, succulent, about a foot high. Leaves whorled, sessile, submersed ones capillary, not rigid, longer than the internodes, $\frac{1}{4}$–$\frac{1}{2}$ in. long; upper leaves floral, narrowly lanceolate, shorter than the internodes except at the apex of the stem, about $\frac{1}{6}$ in. long. Flowers whorled, solitary and sessile in the upper axils. Calyx rose-coloured, 8-veined, campanulate, 4-lobed, not cornuate; lobes deltoid, shorter than the tube. Petals 4, of a deep rose colour, narrowly elliptic, longer than the calyx-lobes. Stamens 4, much exserted. Ovary ovoid, 2-celled, subsessile with hypogynous lobed disk shortly adnate to the calyx-tube, exceeding the frequently torn calyx; style straight, as long as the ovary, included in the calyx. Capsule 2-valved, dehiscing septicidally from apex. Seeds about 6, oval, concave.—(*Hydrolythrum Wallichii*, Hook. f. in Hook. Ic. Pl. 1007; Gen. Pl. i. 777, (*Rotala*, Wall. Cat. 9059) is a congener of this plant.)

Lower Guinea. Angola, Huilla, 5000 ft. alt., fl. and fr. May, *Dr. Welwitsch!*

10. **R. serpiculoides,** *Welw. mss.* Erect, simple or slightly branched, bright green, annual, 1–3$\frac{1}{2}$ in. high. Stems quadrangular and virgate. Leaves linear, attenuate at base into a short quasi-petiole, $\frac{1}{5}$–$\frac{4}{5}$ in. long, erecto-patent. Flowers 1–4 together, shortly peduncled, with subulate bracts at or near the base of the peduncles. Calyx with 4 deltoid lobes, without cornua, reddish at the apex. Petals rare, reddish. Stamens 1 or 2, arising from near base of calyx-tube, included. Ovary 3- (?) celled; style very short. Placenta compressed. Capsule 3-valved, exceeding the calyx, reddish. Seeds compressed.

Lower Guinea. Huilla, 3800–5500 ft. alt., flowers and fruits in April, *Dr. Welwitsch!*

3. **RHYACOPHILA**, Hochst. in Flora 1841, p. 659, non Rhuacophila, Bl.

Calyx campanulate, reddish with 4 wide and shallow rounded mucronate lobes, without cornua; not accrescent. Petals 4, obovate, rather smaller than the calyx-lobes. Stamens 4, arising from near the base of the calyx-tube and opposite the calyx-lobes; filaments filiform. Ovary free, sessile, 2-celled, included in the calyx, without glands at the base; placentas adnate to the dissepiment. Capsule ovoid, surrounded at the base by the calyx and ultimately exceeding it, rather acute at the apex, dehiscing from apex by 2 (rarely 3) valves septifragally, containing about 10 seeds.—Aquatic, glabrous except on the terete stem and branches, with capillary, fascicled or subverticillate, dark green leaves, and terete racemes at the ends of the branches bearing one bract and two rather smaller bracteoles at the base of each flower.—*Quartinia*, Endl. Gen. Pl. Suppl. ii. 94. A. Rich. in Fl. Abyss. i. 277, non A. Rich. in Ann. Sc. Nat. sér. 2, xvi. 259.

A genus of one species, occurring only in Abyssinia.

1. **R. repens,** *Hochst. l.c.* Ascending, often much branched above, 3–18 in. long. Leaves crowded especially above, erect, $\frac{1}{2}$–$1\frac{1}{2}$ in. long. Racemes $\frac{3}{4}$–$1\frac{3}{4}$ in. long; pedicels $\frac{1}{20}$–$\frac{1}{10}$ in. long, erect-patent, alternate, opposite or subverticillate, equalling the lanceolate bract, which with the bracteoles simulates a calyx. Flowers $\frac{3}{5}$ in. long. Stamens exserted. Style exserted, persistent. Capsule $\frac{7}{10}$ in. long. Grows on stones in stagnant water and streams forming reddish purple tufts on the surface.—*Quartinia turfosa*, Rich. Fl. Abyss. i. 277, t. 51.

Nile Land. Abyssinia, *Schimper!*
Flowers and fruits in July.

4. **NESÆA**, Commers.; Benth. et Hook. f. Gen. Plant. i. 779.

Calyx campanulate or urceolate, persistent, with 4–8 lobes and as many cornua or at least callous points not accrescent. Petals obovate, as many as calyx-lobes and corrugated in bud, longer than the calyx except in some of the capitate species, coloured, usually caducous. Stamens usually twice as many as the calyx-lobes, occasionally the same number and in *N. icosandra* about three times, usually all or at least half of them exserted; filaments filiform. Ovary sessile, ovoid; included in the calyx-tube, 2–5-celled, many-ovuled; style exserted; stigma capitate. Capsule dehiscing by valves or by slits at the apex, included in the calyx, membranous; placenta thick, usually lobed; seeds numerous.—Herbs or scarcely undershrubs, growing in wet places especially by river-banks. Leaves opposite or occasionally alternate or even in *N. linifolia* and *N. lythroides* sometimes verticillate. Flowers axillary, in stalked cymes or capitate, sometimes dimorphous. Bracteoles on the pedicels, not at the base of the calyx.

Occurs also in the hot parts of America.

Flowers cymose. Cornua usually short.
Leaves auriculate-sagittate, hairy . . . . . 1. *N. lythroides.*
Leaves exauriculate, glabrous.
Cornua shorter than calyx-lobes, glabrous. Stamens 8–21.
Cornua very small or inconspicuous.
Leaves never whorled. Stamens 18–21 . . . . . 2. *N. icosandra.*
Leaves often whorled. Stamens 16–14 . . . . . 3. *N. linifolia.*
Cornua manifest.
Peduncles longer than the flowers . . . . . 4. *N. heptamera.*
Peduncles not (or scarcely) longer than the flowers.
Flowers tetramerous; pedicels long . . . . . 5. *N. pedicellata.*
Flowers usually hexamerous; pedicels short . . . . 6. *N. Candollii.*
Cornua long, ciliate. Stamens 4 . . . . . 7. *N. andongensis.*
Flowers capitate. Cornua long. (*Tolypeuma.*)
Bracteoles linear. Heads stalked.
Leaves not cordate at the base.
Bracteoles glabrous. Bracts usually 3 . . . . . 8. *N. radicans.*
Bracteoles ciliate. Bracts 2.
Leaves oval. Branches terete . . . . . 9. *N. floribunda.*
Leaves linear-lanceolate. Branches quadrangular . . 10. *N. erecta.*
Leaves cordate at the base . . . . . 11. *N. cordata.*
Bracteoles wide. Heads sessile . . . . . 12. *N. linearis.*

1. **N. lythroides,** *Welw. mss.* Annual. Rhizome densely fibrous. Stems ascending, terete, with stringy cuticle, reddish at the base, covered as well as the cymes and branches with pale patent pubescence; lateral shoots frequently barren, 1–4 ft. high. Leaves lanceolate acute auriculate-sagittate, those on the barren shoots wider; scabrid especially on the margins with white scaly hairs; sessile, alternate opposite and in whorls of 3, $\frac{1}{4}$–$\frac{3}{4}$ in. long. Internodes shorter than the leaves except near the base. Cymes in nearly every axil of the flowering shoots, often partially or wholly without developed flowers, few or many-flowered. Common peduncles distinct or long, with opposite leaf-like bracts at the apex; pedicels equalling the calyx, furnished with bracteoles. Flowers rose-coloured, dimorphous according to the relative lengths of the stamens and style. Calyx campanulate, narrowly so in bud, widely in fruit, pubescent, 4-cornered in bud, 4-lobed and cornuate; lobes shortly deltoid, pointed; cornua patent, shorter than the lobes. Petals exceeding the calyx, widely obovate, veined. Stamens 4, opposite the petals, inserted near the base of the calyx, exserted especially in short-styled plants; anthers yellow. Ovary 2-celled, sessile; style exserted, especially in short-stamened plants. Capsule 2-celled, with septa in perpendicular plane to the somewhat compressed placenta, slightly exceeding the calyx, parting with its apex which breaks off attached to the style, valvular below (?).

Lower Guinea. Angola, Mossamedes, littoral, fl. and fr. Sept., *Dr. Welwitsch!*
Very like *Lythrum sagittæfolium*, Sond. in Linnæa xxiii. 41, which occurs in S. Africa; in specimens of the latter plant there are 8 stamens inserted at the same level, the 4 longer ones alternating with the petals.

2. **N. icosandra,** *Kot. et Peyr. in Pl. Tinn.* 16, t. V. A. Glabrous. Stem somewhat woody at base, erect, 3–6 in. high, quadrangular. Leaves oblong or lanceolate, opposite or lower ones often alternate,

about 1 in. long by $\frac{1}{3}$ in. wide, penninerved, with lateral veins anastomosing near the margin. Internodes often rather longer than the leaves. Cymes 1–6-flowered; common peduncle $\frac{1}{2}$–1 in. long, slender; pedicels short. Bracts subulate, $\frac{1}{20}$ in. long. Calyx urceolate-campanulate, 6–7–8-lobed, $\frac{1}{6}$ in. long, with only callous points instead of distinct cornua; lobes deltoid, one-third length of calyx. Petals 2–6–8, very shortly clawed, red, varying from $\frac{1}{20}$–$\frac{1}{5}$ in. long. Stamens 18–21, in one row. Ovary 4-celled; ovules very numerous; placenta thick; style $\frac{2}{5}$ in. long. Seeds very small, having a tumid edge at the top.

Nile Land. Dembo, *Heuglin.*

3. **N. linifolia,** *Welw. mss.* Glabrous. Woody and reddish at the base with many slender erect subangular pale-green stems and branches, $\frac{1}{2}$–$1\frac{1}{2}$ ft. high. Leaves alternate opposite and in whorls of 3, linear-subulate, $\frac{1}{2}$–1 in. long, erect, patent, sessile. Inflorescence exceeding the leaves. Flowers 1–3 together, on slender pedicels and long peduncles, rose-red. Bracts opposite, small, at top of peduncles; bracteoles opposite on the lateral pedicels. Calyx shortly campanulate, with 8 or 7 lanceolate or deltoid acute lobes shorter than the tube, and with as many external callous points or short cornua. Petals as many as calyx-lobes, obovate-spathulate, shortly clawed, two or three times as long as the calyx, rose-coloured, fugacious. Stamens twice as many as calyx-lobes, inserted at same level at base of calyx-tube, equal; filaments reddish, much exserted; anthers yellow, oblong or oval, curved. Ovary sessile, enclosed in calyx-tube, 4-celled; style much exserted, long, thicker than filaments; stigma capitate. Capsule dehiscing by slits from the apex, ultimately 1-celled, membranaceous, scarcely as long as the calyx; placenta thick, 4-lobed.

Lower Guinea. Angola, Huilla, fl. and fr. November to January, *Dr. Welwitsch!*

Closely related to *N. longipes*, A. Gr. in Pl. Wrightianæ, i. 68, from Texas, which differs from this plant by its longer, constantly opposite, and subauriculate leaves, and by its solitary and hexamerous flowers.

4. **N. heptamera,** *Hiern.* Glabrous. Stem somewhat woody at base, erect, branched from the base, quadrangular, 10–16 in. high. Leaves linear-lanceolate, acute, rounded or subcordate at base, sessile, opposite, $\frac{1}{2}$–$1\frac{1}{4}$ in. long, by $\frac{1}{10}$–$\frac{3}{10}$ in. wide, sub-1-nerved. Internodes rather shorter than leaves. Peduncles slender, $\frac{1}{3}$ in. long, usually 3-flowered. Pedicels about 1–30th in. long, equalling the lanceolate bracts. Flowers usually heptamerous. Calyx urceolate, about $\frac{1}{7}$ in. long, with 7 deltoid acute lobes, and 7 intermediate short patent cornua; lobes about one-third the length of calyx. Petals 7 (?), longer than the calyx. Stamens 14 (?), exserted. Ovary 2-celled; placenta thick; style long, curved.

Mozamb. Distr. Zomba and Lake Shirwa, *Dr. Meller!*

5. **N. pedicellata,** *Hiern.* Glabrous, with erect or ascending slightly branched quadrangular stem, 4–7 in. high. Leaves narrowly elliptic

or obovate, blunt, not cordate at base, not an inch long, $\frac{1}{5}$–$\frac{1}{3}$ in. wide, feebly penninerved with anastomosing continuous and marginal veins, sessile, opposite or near base subopposite. Internodes, except near base, shorter than leaves. Cymes subsessile, bearing from 1–9 flowers; pedicels $\frac{1}{7}$–$\frac{3}{10}$ in. long, slender. Bracts subulate, short, at base of pedicels. Calyx less than $\frac{1}{10}$ in. long, urceolate, with 8 greenish ribs and 4 depressed deltoid lobes one-third depth of calyx, and 4 patent cornua. Petals 4 (?), obovate, lilac (in dried state), longer than calyx. Stamens 8, exserted. Ovary sessile, oval, 2-celled; style very long, tortuous, coloured at the apex. Capsule not or scarcely exceeding the calyx, 2-celled.

Mozamb. Distr. Zanzibar, *Dr. Kirk!*

6. **N. Candollii,** *Guill. et Perr. Fl. Seneg.* 307. Erect, glabrous, with subligneous stem at base and quadrangular upper branches, 1–2 ft. high. Leaves lanceolate-linear, acute, or lower ones sometimes narrowly elliptic, sub-1-nerved, rigid, opposite or subopposite, sessile, semi-amplexicaul, usually longer than the internodes, $\frac{1}{2}$–$1\frac{1}{2}$ in. long by $\frac{1}{12}$–$\frac{1}{4}$ in. wide. Peduncles rather shorter than the flowers or rarely rather longer, 1–3-flowered. Pedicels about half the length of the peduncle. Bracts and bracteoles lanceolate, longer than the pedicel, caducous. Calyx campanulate in flower, urceolate in fruit, $\frac{1}{7}$–$\frac{1}{5}$ in. long, with 6 or rarely 7 deltoid lobes and as many patent short cornua. Petals 6, longer than the calyx, obovate. Stamens 12 or rarely 14, exserted, arising from base of calyx in two rows. Ovary 4- or 5-celled, sessile, ovoid, with 4 (or 5) longitudinal depressions; style long, curved. Capsule 4- or 5-valved, dehiscing septifragally, equalling the calyx; placenta central, 4- or 5-lobed.—*Ammannia dodecandra*, DC. Prod. iii. 80.

Upper Guinea. Senegal, *Heudelot! Perrottet!* fl. from Sept. to Dec.

7. **N. andongensis,** *Welw. mss.* Biennial with creeping rhizome; erect, with spreading tetragonal opposite subpuberulous branches, reddish at base, 2–6 in. high. Leaves opposite, deep green, subglaucescent, ovate or ovate-oblong, wide near base or cordate and acute at apex (very rarely the lower leaves are obovate and cuneate at base), subsessile, spreading, $\frac{1}{4}$–$1\frac{1}{4}$ in. long by about half the width, obscurely veined, slightly rough; margins somewhat thickened, recurved, whitish, sublepidote. Cymes usually 3-flowered; common peduncle short, or $\frac{1}{10}$–$\frac{1}{5}$ in. long, with caducous leaf-like bracts at base. Pedicels short, with 2–4 bracteoles at base. Bracteoles linear-subulate or linear-lanceolate, short or equalling the calyx. Calyx 8-veined, with 4 shortly deltoid lobes at apex, and 4 cornua ciliate-horned at apex, in fruit erect with incurved apex and longer than the lobes. Petals 4, obovate-spathulate, of a deep rose-colour, longer than the calyx, very fugacious. Stamens 4, inserted near base of calyx-tube and exceeding it; anthers yellow. Style distinct, persistent on top of the 4-celled ovary. Capsule included in calyx-tube, dehiscing by separation of roundly 4-sided

very short lid and longitudinally by 4 short valves below this lid. Seeds subdiscoidal, concave on one side, convex on the other.

Lower Guinea. Angola, Pungo Andongo, fl. and fr. March and April, *Dr. Welwitsch!*

Grows in marshy places, by rivers or cool springs.

8. **N. radicans,** *Guill. et Perr. Fl. Seneg.* 306, t. 70. Glabrous or nearly so. Stem decumbent, rooting and aquatic at base, or in drier places suberect, slender, varying in length up to 4 ft. Leaves opposite, elliptic or obovate-lanceolate, rounded pointed or acute at apex, rounded or narrowed at base, shortly stalked or subsessile, 1–2 in. long. Internodes equal to or exceeding the leaves. Flowers capitate, shortly pedicelled, 5- or 6-parted. Peduncles in well-developed specimens longer than the leaves, as long as or longer than the internodes, slender. Heads usually with 3, sometimes 2, broadly cordate venose imbricated bracts and linear-acute bracteoles. Bracteoles 1-veined, glabrous, with scarious margins. Calyx 10- or 12-veined, glabrous, cornua longer than lobes, ciliate at least at apex. Petals as long as calyx, rose-coloured, very fugacious. Stamens twice as many as calyx-lobes, inserted at same level near bottom of calyx-tube, those opposite the calyx-lobes rather the longer, all exceeding the calyx. Ovary 2- or 3-celled, included in the calyx-tube; style long; stigma small, capitate or punctiform.

Upper Guinea. Senegal, *Perrottet!* fl. from October to March.
Lower Guinea. Angola, Mossamedes, fl. July, *Dr. Welwitsch!*

Grows by river banks or in marshes.

9. **N. floribunda,** *Sond. Fl. Cap.* ii. 517. Stem and branches patently pubescent or subglabrous, subterete, 1–2 ft. high, or in dry places from 2 in. high upwards. Leaves elliptic, blunt or pointed at apex, narrowed or rounded but not cordate at base, sessile, opposite, with appressed pubescence or subglabrous, 1–2¼ in. long, or in small plants from ½ in. long. Peduncles shorter than leaves and internodes, ½–¾ in. long. Capitula solitary, having 2 opposite imbricated broadly ovate subcordate bracts at base; bracteoles oblong or linear, ciliated. Calyx with glabrous tube except at top and 4–7 short deltoid pubescent lobes and as many erect longer ciliate cornua. Petals as many as calyx-lobes, caducous, purple (?), shorter than calyx. Stamens as many or twice as many as calyx-lobes, arising from some level at about middle of interior of calyx-tube. Ovary 3- or 4-celled. Capsule 3- or 4-valved, dehiscing septifragally at apex; placenta ovoid or compressed, thick, lobed.

Mozamb. Distr. Zanzibar!
South Central. Victoria Falls, *Dr. Kirk!*
Lower Guinea. Angola, Mossamedes (small plant in flower in August), *Dr. Welwitsch!*

This species occurs also in South Africa. Grows in sandy places by river banks.

10. **N. erecta,** *Guill. et Perr. Fl. Seneg.* 305. Erect or ascending, subglabrous, with quadrangular stem and branches, 2½–10 in. high.

Leaves linear or lanceolate, narrowed at base, usually acute at apex. $\frac{1}{3}$–$\frac{3}{4}$ in. long, scaly or glabrous, opposite, patent, 1-nerved. Peduncles nearly as long as leaves, glabrous or with patent bristles. Capitula solitary, bearing from 3 to many flowers, surrounded at base by 2 imbricated broadly cordate acuminate bracts; bracteoles linear-oblong, ciliate, at least near apex, 8–12-nerved. Calyx with 4–6 short deltoid lobes and as many longer erect subulate ciliate cornua. Petals 4–6, lilac. Stamens as many or twice as many as lobes of calyx.—*N. humilis*, Kl.

Upper Guinea. Senegal, *Heudelot!* fl. Oct. and Nov. *Ingram!*
Nile Land. Abyssinia, *Q.-Dillon!*
Lower Guinea. Angola, Mossamedes, fl. September, *Dr. Welwitsch!*
Mozamb. Distr. Mozambique, *Peters!*
Occurs also in Madagascar.
Grows in wet gravelly places.

11. **N. cordata,** *Hiern.* Erect, annual, branched, quadrangular above, scabrous or subglabrous, $2\frac{1}{2}$–9 in. long. Leaves ovate-lanceolate or lanceolate, cordate at base, opposite, sessile, acute, $\frac{1}{3}$–$\frac{1}{2}$ in. long, asperulous. Peduncles usually rather shorter than the leaves, subglabrous. Capitula numerous, solitary, about 5-flowered, surrounded at base by 2 imbricated broadly cordate acuminate cymbiform bracts; bracteoles linear acute, ciliate. Flowers subsessile, small. Calyx campanulate, with 8–12 ribs and 4–6 deltoid lobes and as many longer erect ciliate cornua. Petals 4–6, rose-coloured, longer than calyx-lobes, shorter than the cornua, caducous or wanting. Stamens as many or twice as many as lobes of calyx, exserted. Ovary sessile.

Upper Guinea. Niger, *Barter!*
Nile Land. Madi, *Speke and Grant!* (*N. erecta*, S. & G. Journ. App.)
Lower Guinea. Angola, Pungo Andongo, 2400–3800 ft. alt. Fl. March, fr. early in April, *Welwitsch!*
Grows in swamps.

12. **N. linearis,** *Hiern.* Glabrous annual, about 2 ft. high, with erect stem, subterete at base, subquadrangular by decurrence of leaves and much branched above. Leaves linear, acute, 1-veined, opposite, narrowly decurrent, 1–3 in. long. Capitula large, terminal on ends of branches, thick and many-flowered, surrounded at base by several imbricated bracts, immediately below which are a pair of linear leaves. Bracts reniform, much acuminate, venose, with some clusters of flowers interspersed. Flowers in subsessile clusters and subsessile in the cluster, each with a bracteole partly enclosing it; bracteoles oblong, auricled and acuminate at the apex, in fact nearly the obverse of the bracts on a smaller scale, folded round the flowers in a conduplicate manner, other smaller bracteoles interspersed (abortive flowers?). Flowers pentamerous, rarely tetramerous; in the former case, calyx campanulate, membranous, 10-nerved, with 5 deltoid acute lobes inclining inwards, and as many longer cornua; cornua erect or arching first outwards and then upwards, simple, or slightly divided irregularly in upper part. Petals 5, narrowly obovate, caducous, nearly as long as the tube of the calyx, purple (?), or wanting. Stamens 10, inserted

near base of interior of tube of calyx, those opposite the cornua being inserted on a rather higher level than the rest, exserted. Ovary oval; style very long, tortuous in upper part. Capsule 4 (?) -valved, with thick lobed placenta.

Mozamb. Distr. Mozambiqne, *Forbes!* Zambesi, *Dr. Kirk!*
Occurs also in Madagascar.

5. **AMMANNIA**, Linn. Gen. n. 155; Benth. et Hook. f. Gen. Plant. i. 776 (part).

Calyx membranous, persistent, campanulate in flower, with 4 deltoid lobes and 4 external cornua narrower than the lobes. Petals 4, caducous or wanting, usually not larger than the calyx-lobes, white, violet purplish rose-coloured or in *A. passerinoides* yellow, not corrugated in bud. Stamens 4, opposite the calyx-lobes, or 8, in one row, usually arising from near the base of the calyx-tube, about the length of the calyx or exserted; filaments slender. Ovary free, 1–4-celled; ovules numerous; style filiform, persistent, usually short or long according as the stamens are included in the calyx or exserted; stigma capitate. Capsule usually spherical and exceeding the calyx, bursting irregularly, more or less circumsciss, usually 1-celled and longer than the calyx; placentation ovoid, compressed or peltate. Seeds numerous, small, globular or triangnlar in outline, often concave on one side; radicle very short. In a few species the flowers are occasionally pentamerous. —Annual or biennial herbs, with leaves sessile or subsessile, usually glabrous and opposite. Flowers in axillary cymes, with 2 bracteoles at the base of the pedicels.

Occurs in damp places in the Tropics of both hemispheres; some species are extra-tropical, and one is naturalized in Italy.

Glabrous or subglabrous. Leaves opposite. Petals not yellow.
  Calyx-cornua small. Capsule bursting transversely across middle. (*Hapalocarpum*).
    Stem not spongy. Leaves lanceolate.
      Cymes with evident peduncles.
        Stem branched or leafy at base . . . . . 1. *A. senegalensis.*
        Stem naked at base . . . . . 2. *A. sulsuginosa.*
      Cymes subsessile.
        Erect, with spreading branches.
          Fruit-calyx hemispherical, shorter than the capsule.
            Pedicels evident. Leaves attenuate at base . . 3. *A. baccifera.*
            Flowers subsessile. Leaves often somewhat narrowed but not attenuated at base . . . . . 4. *A. salicifolia.*
          Fruit-calyx urceolate, enclosing capsule . . . . 5. *A. urceolata.*
        Decumbent, with sinuous branches . . . . . 6. *A. diffusa.*
    Stem spongy. Leaves obovate . . . . . 7. *A. crassicaulis.*
  Calyx-cornua conspicuous. Capsule bursting transversely near apex (*Ditheca*).
    Leaves fleshy . . . . . 8. *A. sarcophylla.*
    Leaves not fleshy.
      Cymes sessile. Leaves ovate-oblong . . . . . 9. *A. Loandensis.*
      Cymes usually peduncled. Leaves lanceolate . . . . 10. *A. aspera.*
Pubescent. Leaves alternate opposite, and whorled. Petals yellow . . . . . 11. *A. passerinoides.*

1. **A. senegalensis,** *Lam.; DC. Prod.* iii. 77. Glabrous. Stem erect or procumbent, usually tetragonal or 4-winged, sometimes subterete, 1–24 in. high. Leaves linear oblong or lanceolate, blunt at the base, usually auriculate-cordate and amplexicaul, $\frac{1}{5}$–$2\frac{1}{2}$ in. long, patent. Peduncles bearing one few or many pedicelled flowers, smaller towards the extremities of the stem and branches. Calyx campanulate, 8-ribbed. Petals 4, caducous or wanting, white or coloured. Stamens 4 or 8, exserted or as long as the calyx. Style long or short. Occasionally a flower is pentamerous.—Conf. *A. madagascariensis,* Bvn.; Tul. Ann. Sc. Nat. sér. 4, vi. 129 (1856).

A variable species, growing in damp places, and extending to India, Java, and Brazil. The following forms may be noticed:—

α. auriculata, Willd. (sp.). Sometimes glaucescent. Cymes much shorter than the leaves, bearing many rather large flowers. Stamens exserted. Style long. *A. floribunda,* Guill. and Perr., Fl. Seneg. i. 302. *A. undulata,* Fisch. and Mey. *A. Prieureana,* Guill. and Perr. l.c. 303.

β. filiformis, DC. (sp.). Stem quadrangular, filiform, with few diffuse branches 3–6 in. long. Cymes lax. Stamens 4.

γ. riparia. Stem 14 in. high, erect, quadrangular, bifid near base. Leaves widened at middle and much auricled at base, amplexicaul. Stamens 4, long. Style long. Capsule large, not much exceeding the subtruncate calyx.

δ. patens. Annual or biennial. Stem a foot high or more, quadrangular, with patent leaves and branches. Cymes dense, many-flowered, with short slender peduncles and pedicels. Stamens 4, short. Style short; ovary 2-celled.

ε. multiflora, Roxb (sp.). Stem 6–24 in. high, quadrangular, with erect-patent branches. Flowers and capsule small. Cymes with long slender pedicels. Stamens 4 or 8, long. Style long. Petals rather large, reddish —*A. pusilla,* Sond.

ζ. brasiliensis, A. St. Hil. Fl. Bras. Mér. iii. 135, t. 187. Annual. Stem erect or ascending, 3–13 in. high, quadrangular, Petals when present reddish, shorter than the calyx. Stamens 4, exserted; anthers yellow. Style long; ovary 2-celled. Cymes nearly equalling the leaves; peduncles long and slender.

Upper Guinea. Senegal. *α. Perrottet!* 331, 336; *Bidjem! Roger! β. Perrottet!* 320 (fl. Sept. and Oct.). *ε. Bidjem!* 212; *Boteler!* Niger, *ε. Barter! Baikie!*

Nile Land. Kordofan. *α. Kotschy!* 178, 435. Abyssinia, *γ. Schimper!* 1742, Madi, *δ. Speke and Grant!* Sennaar, *ε. Kotschy!*

Lower Guinea. Mossamedes. *α. Dr. Welwitsch!* 2350, 0 ft. alt., fl. August. Congo, *δ. Chr. Smith!* Angola, *δ. Welwitsch!* 2352. Golungo Alto, 1000–2400 ft. alt. *ε. Welwitsch!* 2351. Pungo Andongo, 2400–3800 ft. alt. *ε. Welwitsch!* 2353. 2354. Ambaca, 2900 ft. alto. *ζ. Welwitsch!* 2358, 2359. Pungo Andongo, 2400–3800 ft. alt. *ζ. Welwitsch!* 2360. Mossamedes.

Mozamb. Distr. Zambesi. *ε. Meller!*

2. **A. salsuginosa,** *Guill. et Perr. Fl. Seneg.* 302. Glabrous. Stem erect, naked below, 1 ft. high. Leaves narrowly oval, blunt, somewhat narrowed below the middle, with one central vein depressed on upper face of leaf, $\frac{1}{4}$–1 in. long. Cymes peduncled, bearing usually 3 pedicelled flowers. Calyx with campanulate 8-ribbed tube, 4 depresso-deltoid lobes and 4 small cornua. Petals minute or wanting. Stamens 4, inserted a little above base of interior of calyx, included. Style short, erect; stigma capitate. Capsule half covered by persistent calyx.

Upper Guinea. Island Sor, near St. Louis, *Heudelot! Perrottet!* fl. Sept. and Oct.

In the specimens of this plant from Tropical Africa, both at Kew and the British

Museum, the flowers are in several cases monstrous, in consequence of having been attacked by insects.

This species occurs also in Natal.

3. **A. baccifera,** *Linn. Sp.* 175. Glabrous annual with erect stem and spreading tetragonal branches, 2–14 in. high, reddish at base. Leaves linear-lanceolate, attenuate to base, subsessile, usually patent, often shining, $\frac{1}{2}$–$2\frac{1}{4}$ in. long. Cymes 3–7-flowered, pedicelled, with small bracteoles at base of pedicels similar to the leaves. Calyx with 4 deltoid lobes, 8-veined; cornua small. Petals 4, small, caducous or wanting. Stamens 4, inserted below the middle of the calyx-tube, about equalling the calyx. Ovary sessile, enclosed in calyx-tube; style very short. Capsule globular, exceeding the calyx, dehiscing transversely about the middle, 1- or imperfectly 2-celled; placenta compressed. Rarely a flower is pentamerous.—*A. vesicatoria*, Roxb. Fl. Ind. i. 426. *A. indica*, Lam. Illust. n. 1555. *A. attenuata*, Hochst.

The fresh leaves are used in the East Indies to raise blisters. Grows in marshy places.

Nile Land. Khartoum, *Dr. Bromfield!* between Dongola and Korti, *Dr. Bromfield!* banks of White Nile, *Petherick!* Kordofan, *Kotschy!* Abyssinia, *Schimper!* 778.

Lower Guinea. Angola, Mossamedes, and Pungo Andongo, 2400–3800 ft. alt., *Dr. Welwitsch!*

Occurs also in India and Madagascar.

4. **A. salicifolia,** *Monti in Comment. Bonon.* i. 112, *cum tab.* (1767). Glabrous annual, 4–18 in. high. Stem erect, terete at base, with long quadrangular spreading branches. Leaves lanceolate, narrowing gently from above middle towards base, sessile, sometimes auricled at base, not amplexicaul, opposite, patent at the flowering parts deflected at the fruiting parts, 1-veined, $\frac{1}{2}$–$1\frac{1}{2}$ in. long. Flowers in axillary sessile cymes with very short pedicels, densely verticilled especially in fruit, 4–9 in each axil. Calyx with a short four-cornered spreading limb at top of a tube campanulate in flower and hemispherical in fruit; lobes of calyx 4, deltoid, incurved in flower, usually with short patent cornua. Petals wanting or caducous. Stamens 4, not exceeding the calyx, arising from near the base of its tube. Ovary when young obovoid, with 4 external longitudinal lines; style very short. Capsule 1-celled. Seeds attached to a placenta which in middle of capsule is compressed horizontally in a peltate manner and at top and bottom consists of a central axis, somewhat triangular in outline, concave, very minutely punctate.—*A. ægyptiaca*, Willd. Hort. Berol. t. 6. *A. verticillata*, Lam. Illust. 1554, t. 77, f. 3. *A. glauca*, Wall. Cat. 2100.

Nile Land. Abyssinia, *Ehrenberg!* Nubia, *Dr. Bromfield!*

Lower Guinea. Congo, *Chr. Smith!* Angola, Pungo Andongo, 2400–3800 ft. alt., Mossamedes, *Dr. Welwitsch!*

Grows by river banks and in marshes. Extends to India, and is naturalized in Italy.

5. **A. urceolata,** *Hiern.* An erect simple or branched annual, 4–8 in. high. Branches spreading, quadrangular, hispidulous. Leaves linear, bluntish or acutish at apex, gently narrowing from middle to-

wards base, sessile, not auricled, 1-veined, subscabrous, opposite (at ends of branches subopposite), $\frac{1}{2}$–2 in. long by $\frac{1}{2}\frac{1}{0}$–$\frac{1}{5}$ in. wide. Upper internodes about a quarter the length of the leaves. Flowers in dense axillary clusters, about 6 in each axil, with small linear or lanceolate scarcely glabrous bracts. Calyx usually covered with numerous small squarrose scales, urceolate, with 4 or rarely 5 ovate-deltoid mucronate lobes at apex. Petals wanting. Stamens as many as the lobes of the calyx; filaments arising from about middle of the tube, short, included. Style short. Capsule 1-celled, enclosed in the tube of the calyx which is constricted above it.

Nile Land. Kordofan, *Kotschy!*

6. **A. diffusa,** *Willd. En. Pl. Hort. Berol.* 167. Stem prostrate, terete, rooting at the base, flexuous, branched, about a foot high. Leaves lanceolate, rather blunt at apex, narrowed at the very base, scarcely auricled, about $\frac{1}{2}$ in. long. Internodes $\frac{1}{2}$–$\frac{3}{4}$ in. long. Flowers and fruit small. Bracteoles minute. Flowers when young crowded, few together on slender filiform pedicels and scarcely any peduncle. Calyx 8-veined. Petals 4, of a violet colour, exceeding the calyx or wanting. Stamens 4 or 8, equalling or exceeding the calyx, when only 4 opposite the calyx-lobes. Ovary 2-celled; style rather short.—*A. gracilis*, Guill. et Perr. Fl. Seneg. 301.

Upper Guinea. Senegal, fl. April, *Perrottet!*

7. **A. crassicaulis,** *Guill. et Perr. Fl. Seneg.* 303. Stem spongy, erect or ascending, rooting near base, about a foot long. Leaves ob-ovate-oblong, subsessile, attenuate at base, $\frac{3}{4}$–$1\frac{3}{4}$ in. long, $\frac{1}{4}$–$\frac{3}{4}$ in. wide. Cymes 1–7-flowered; common peduncle short in flower, lengthened in fruit; pedicels slender, long. Calyx with 4 shallow rounded emarginate lobes, enlarged in fruit. Petals caducous. Stamens 4 (or 8 according to Guill. et Perr.), arising from bottom of calyx-tube, as long as the calyx or rather longer. Ovary 4-celled at base, 2-celled above; style short. Capsule large with thin purplish pericarp; placenta compressed.

Upper Guinea. Senegal, *Perrottet!* (flowers from March to May.)
North Central? *E. Vogel!*

8. **A. sarcophylla,** *Welw. mss.* Annual, rather fleshy, branched from the base, with rather thick stem and branches, here and there rooting at the nodes and prostrate; branches tetragonal, sometimes a foot long. Leaves rather rigid, glaucescent, varying from ovate-lanceolate with a cordate-auriculate base to auriculate-rotund, blunt, nearly an inch long, spreading; margins somewhat thickened, recurved, sub-lepidote. Flowers in dense subsessile axillary clusters, those on opposite sides of the branch confluent. Bracteoles lanceolate, minutely ciliate on margins, unequal, some as long as the flower. Calyx campanulate, with 4 deltoid lobes and 4 longer cornua; cornua papillose or ciliate at apex. Petals wanting. Stamens 4, equalling the calyx. Style very

short. Capsule 1-celled, dehiscing transversely near apex and also by short longitudinal fissures beneath, equalling or exceeding the calyx; placenta compressed.

Lower Guinea. Angola, Mossamedes, fl. July, fr. August, *Dr. Welwitsch!*

9. **A. Loandensis,** *Welw. mss.* Annual, of a deep green colour, prostrate with several stems from the crown of the root 3–7 in. long; branches opposite, spreading, ascending, tetragonal. Leaves oval-oblong, subsessile, usually lanceolate, acute at apex and cordate or wide near base, $\frac{1}{2}$–1 in. long by a third the width, slightly rough, subglaucescent below, margins thickened, recurved, whitish, sublepidote. Flowers in sessile many-flowered cymes with slender unequal pedicels which do not or scarcely exceed the calyx in length. Bracteoles 2 or more, linear-subulate at base of pedicels. Calyx campanulate-oblong in bud with conical base, 8-striate, with 4 shortly deltoid lobes, and 4 longer cornua, ciliate at apex or papillose. Petals very rare, not minute when present. Stamens 4, equalling the calyx. Style distinct. Capsule dehiscing transversely near the top and with short slits beneath; placenta compressed.—Near *A. cordata*, Wight, Prod. Pen. Ind. Or. 304 (1834).

Lower Guinea. Angola, Loanda, fl. July, *Dr. Welwitsch!*

10. **A. aspera,** *Guill. et Perr. Fl. Seneg.* i. 304. Erect or ascending, branched near the base, 3–6 in. high, subglaucous, slightly rough or asperulous; branches tetragonal, at base subterete and reddish, the lower ones procumbent. Leaves lanceolate, widely cuneate or subcordate at the base, suddenly attenuate into a very short petiole, $\frac{1}{4}$–1 in. long by 1–3 lines wide, rather rigid, spreading; margins thickish, recurved, whitish, faintly denticulate. Inflorescence cymose, trichotomous, many flowered. Common peduncle usually $\frac{1}{10}$–$\frac{1}{7}$ in. long, with the leaf-stalk adnate to its base and often with 2 leaf-like bracts at top; bracteoles unequal at base of pedicels; pedicels distinct. Calyx with 4 short deltoid lobes and as many conspicuous cornua, 8-ribbed. Petals wanting. Stamens 4, equalling the calyx, opposite the calyx-lobes (or according to Guill. et Perr. l.c., opposite the cornua). Ovary sessile, 4-lobed, 2-celled; style rather short. Capsule reddish, rather exceeding the calyx, 1-celled, dehiscing by a short transverse lid and by short slits beneath. Seeds concave on one side convex on the other, dark.

Upper Guinea. Senegal, Kounoun, Cape Verd, fl. March, *Perrottet!*
Lower Guinea. Angola, Mossamedes, fl. and fr. August, *Dr. Welwitsch!*

11. **A. passerinoides,** *Welw. mss.* Annual or biennial, woody at base, 2–4 ft. high, with pilose pubescence; stem erect, slender, at base terete reddish simple and leafless, above with erect or ascending branches, tetragonal, hoary and leafy. Leaves opposite alternate or in whorls of 3 or 4, hastate, sessile, lanceolate, apiculate, hoary-pilose, on barren lateral branches broader and shorter; margins recurved con-

siderably, about $\frac{3}{5}$ in. long. Flowers subsessile, 3–7 together, hairy. Bracts leaf-like, embracing the outer flowers, or linear subulate, hairy. Calyx campanulate, afterwards shortly campanulate, with 4 short lobes and 4 longer cornua, yellowish when young. Petals 4, lanceolate, minute, pale yellow or wanting. Stamens 4, exserted, or rarely 8 of which 4 are included. Ovary 2-celled; style of moderate length. Capsule transversely dehiscent, subglobular or ellipsoidal, reddish, somewhat exceeding the calyx.

Lower Guinea. Angola, Huilla, fl. and fr. March, *Dr. Welwitsch!*

6. **WOODFORDIA**, Salisb.; Benth. et Hook. f. Gen. Plant. i. 778.

Calyx tubular, coloured, somewhat curved and widened upwards, terminating with an oblique mouth which has 6 small equal deltoid lobes and as many external callous points or short cornua, glabrescent, persistent, in fruit oval-oblong and contracted at the mouth. Petals 6, opposite the cornua, lanceolate-linear, acute, very small or wanting. Stamens 12, inserted near base of calyx, much exserted, declinate, the alternate ones longer; filaments filiform, curved near the apex; anthers ovate, attached by the middle of the back to the filaments. Ovary free oblong, narrowing at apex into style, 2-celled, somewhat laterally compressed; ovules numerous; style filiform, curved, exserted; stigma punctiform, emarginate. Capsule 2-celled, linear-oblong, included in the calyx; pericarp membranous; placenta thick. Seeds small.—A shrub or moderate-sized tree with opposite subsessile leaves, red flowers arranged in axillary clusters or rarely solitary, and pedicels dilated at the apex and bearing 2 small bracts at the base.

A genus of but one species, inhabiting also China, East India, Madagascar, and Comorin Islands.

1. **W. floribunda,** *Salisb. Parad. Lond.* t. 42. Much branched shrub, scattered with minute black glands, especially on the leaves. Leaves opposite, entire, rounded or subcordate at base, subsessile, ovate-lanceolate or lanceolate, acuminate, paler beneath, coriaceous; midrib lateral and marginal veins depressed or weak above and raised beneath. Pedicels dilated upwards and continuous with inferior portion of ovary. Flowers about $\frac{3}{4}$ in. long to end of stamens. Calyx about $\frac{1}{3}$ in. long, by $\frac{1}{7}$ in. wide, red; lobes $\frac{1}{16}$ in. deep. Stamens nearly the same length, but alternate ones rather longer; anthers dark red. Style thicker than filaments, tapering.—*Grislea tomentosa,* Roxb.; DC. Prod. iii. 92.

This plant appears to be trimorphic according to the relative length of the style and stamens. It reaches 7000 ft. in Abyssinia Flowers in December and January.

Var. α. *tomentosa.* Leaves griseo-tomentose, peduncles 4–8-flowered. Petals longer than calycine lobes. *Grislea multiflora,* Rich. Fl. Abyss. i. 281.

Var. β. *glabrata.* Leaves subpubescent or subglabrous, peduncle 1-flowered. Petals shorter than calycine lobes. *Grislea uniflora,* Rich. l.c.; *G. micropetala,* Hochst. Abyssinian names, Fisbĕāélto, Dis-bellalloo.

Nile Land. α. and β. Abyssinia, *Schimper!* &c. β. Semaar, *Kotschy!*

7. **PEMPHIS,** Forst.; Benth. et Hook. f. Gen. Plant. i. 780.

Calyx coriaceous, glabrous inside, with a 12-ribbed campanulate or infundibuliform tube and 6 small deltoid erect apical lobes and as many small patent cornua. Petals 6, obovate, patent, corrugated in bud, inserted near the top of the calyx-tube opposite the cornua, as long as the calyx, deciduous. Stamens 12, in two series, included in the calyx-tube, 6 opposite the calyx-lobes half as long again as the 6 opposite the cornua and inserted at rather a higher level; 6 opposite the cornua about half the length of the calyx-tube, inserted about $\frac{1}{3}$ above the base of the calyx-tube; filaments filiform; anthers widely oblong. Ovary free, glabrous, sessile or shortly stipitate, subglobose, included in the calyx-tube, 3-celled at the base, many-ovuled; style straight; stigma capitate. Placenta with a turbinate fleshy and shortly-stalked base and membranous wings above. Capsule 1-celled by obliteration of the septa, slightly exceeding the calyx-tube and bursting transversely near the apex. Seeds numerous, large, triangularly pyramidal, curved, glabrous, with thick testa.—A tree or shrub, with opposite leaves which with the calyx and young parts are covered with a grey silky pubescence. Flowers solitary, stalked, axillary; bracts narrow, opposite, fugacious.

A genus of but one species, scattered along the coasts and islands of the Indian and Pacific oceans.

1. **P. acidula,** *Forst.; DC. Prod.* iii. 89. A tree, sometimes attaining 35 ft. in height. Stem terete; branches opposite, somewhat angular towards the extremities by the very narrow decurrence of the petioles. Leaves coriaceous, narrowly elliptic, more or less cuneate at the base, crowded near the ends of the branches, $\frac{1}{2}$–$1\frac{1}{2}$ in. long; petioles $\frac{1}{20}$–$\frac{1}{10}$ in. long; lateral veins inconspicuous; pubescence appressed. Peduncles articulated to the branches, covered with patent pubescence, about equalling the calyx. Calyx $\frac{1}{5}$–$\frac{1}{4}$ in. long, thickened within below the insertion of the stamens; ribs depressed, converging in 6 pairs to the apices of the lobes. Petals varying from white to deep pink. Ovary flattish on the top but suddenly contracted at the apex into the style which exceeds the stamens. Capsule glabrous, with thin pericarp.

Mozamb. Distr. Zanzibar, *Dr. Kirk! Peters!*

8. **LAWSONIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 782.

Calyx with short campanulate tube, 4 diverging ovate acute or mucronate lobes and a callous ring at top of tube into which petals and stamens are inserted; without cornua. Petals 4, widely obovate, subcordate, corrugated in bud. Stamens 4–8, equal, opposite and longer than the lobes of the calyx, alternating singly or in occasional pairs with the petals; filaments tapering; anthers widely oblong. Style as long as the stamens, persistent; stigma punctiform; ovary

free, sessile, globose, not included in tube of the calyx, 4-celled. Placenta central, with 4 lobes projecting into the cells of the ovary. Capsule globular, bursting irregularly across, 2- or 4-celled; septa membranous; pericarp thin, brittle. Seeds large, pyramidal; testa thick; embryo straight; radicle $\frac{1}{3}$ length of embryo, cylindrical; cotyledons thick, $\frac{5}{6}$ length of embryo, cordate-auricled at base, embracing the radicle.—Glabrous shrub with opposite leaves and branches. Inflorescence in terminal and lateral panicled cymes. Bracts small, deciduous.

This genus has but one species, and is widely cultivated.

1. **L. alba,** *Lam. Enc.* iii. 106. Shrub 6 ft. high, with terete stem and subterete divaricate branches, of same pale colour throughout. Leaves elliptic or obovate, cuneate at base into short petiole, usually acute or spinous-pointed at apex, submembranous, entire, $\frac{1}{2}$–$1\frac{1}{2}$ in. long; midrib depressed on upper surface of leaf; lateral veins not conspicuous. Flowers sweet-scented. Pedicels about 1–2 lines long, slender. Tube of calyx $\frac{1}{3}$ length of the calyx; lobes pointed. Petals greenish-white. Stamens usually 4, alternating with the petals; sometimes more numerous when a pair springs from near the same point of the callous ring of the calyx between the petals. Capsule $\frac{1}{6}$–$\frac{1}{5}$ in. in diameter.

The plant is sometimes spinous, and then it is *L. spinosa*, Linn.; in other cases it is *L. inermis*, Linn. Often cultivated under the name of *Henna*, and used as a dye. The leaves are ground in their raw state, and then mixed with lime-juice, to be put on the tips of the fingers, either to stain them red or to prevent whitlow.

Upper Guinea. Senegal, *Roger! Perrottet.* Sierra Leone (in gardens), *Barter! Nicols!* Niger, *Barter!*

Nile Land. Philæ, *Speke and Grant!* Nubia, *Kotschy!*

In other countries the stamens are usually 8.

9. SONNERATIA, Linn. f.; Benth. et Hook. f. Gen. Plant. i. 784.

Calyx thick, coriaceous, with campanulate or hemispherical tube and 6 or 7 lobes as long as the tube valvate in bud, not cornuate. Petals as many as the lobes of the calyx and shorter than them. Stamens very numerous, in several rows, inserted on a ring at the top of a perigynous sheath; filaments long; anthers reniform, versatile. Ovary adherent to the tube of the calyx towards its base, depresso-spherical, many-celled; cells many-ovuled; style straight; stigma subcapitate. Placentas thick, axile. Fruit many-celled, ultimately free from the calyx and stipitate; cells many-seeded. Seeds curved, angular; testa thick, crustaceous; cotyledons shorter than the terete radicle.—Glabrous trees or bushes with opposite coriaceous leaves and large flowers.

A small genus, scattered over tropical shores of the Old World.

1. **S. acida,** *Linn. f.; DC. Prod.* iii. 231. A bush or small tree with terete and opposite branches, tumid at the nodes. Leaves roundly oval, with somewhat wavy margins, slightly wedge-shaped at base,

about 3 in. long, petiole $\frac{1}{3}$–$\frac{1}{5}$ in. long; lateral veins numerous but inconspicuous. Flowers bracteate (*fide* Dr. Kirk), solitary at the ends of the stem and branches. Lobes of calyx lanceolate. Petals strap-shaped, $\frac{3}{4}$ length of the lobes of the calyx. Stamens "in 3 rows." "Style and stigma tubular ending in a cavity lined by the prominent ridges of the style corresponding to each carpel." Fruit bursting irregularly from the base, leaving the central axis attached to the calyx. Seeds 6 or 7 in each cell, radiating from the centre of the fruit. Cotyledons oily.—*S. mosambicensis*, Kl. in Peters' Mossamb. Bot. 66, t. 12.

Mozamb. Distr. Mozambique, *Dr. Kirk! Peters.*
Occurs also in Tropical Asia.

10. **STREPHONEMA**, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 782.

Calyx coriaceous with openly campanulate tube and 4 or 5 equal short lobes. Petals as many as the lobes of the calyx and alternating with them, inserted at top of its tube, not corrugated, obovate, white (?), clawed. Stamens twice as many as the lobes of calyx, in 2 rows, half opposite petals and inserted just below them, the rest shorter, alternating with them and inserted at a lower level; filaments slender, long, tortuous; anthers short. Ovary partly adherent to tube of calyx, 1-celled, 1–2-ovuled; ovules pendulous from opposite sides of the top of interior of ovary; style slender, long; stigma punctiform or bifid at the apex. Fruit succulent, drupaceous (?), 1-celled, 1-seeded.—Shrubs or small trees, with alternate or subopposite coriaceous leaves, subterete branches, panicled subumbellate inflorescence, caducous bracts and verticillate bracteoles at base of umbellules.

This genus, endemic in Upper Guinea, is anomalous among the rest of this Family on account of its 1-celled 1–2-ovuled ovary.

Plant glabrous. Leaves not cuneate at base . . . . . 1. *S. Mannii.*
Young parts silky. Leaves cuneate at base . . . . . 2. *S. sericea.*

1. **S. Mannii,** *Hook. f. l.c.* Glabrous shrub, 15 ft. high, with flowers fascicled axillary or crowded on short branches. Leaves alternate, oblong, shining, suddenly shortly and narrowly acuminate, with recurved margins, midrib and lateral veins depressed on upper surface, rounded at base or nearly so, $4\frac{1}{2}$–9 in. long by $1\frac{1}{2}$–$3\frac{1}{2}$ in. wide. Petiole $\frac{1}{6}$–$\frac{1}{2}$ in. long, stout, suddenly narrowed on under side into midrib of leaf, thus making a false articulation with it. Buds globose. Pedicels slender, $\frac{1}{5}$–$\frac{1}{3}$ in. long. Bracteoles oblong, small. Calyx with 4 or 5 roundly deltoid lobes, $\frac{1}{3}$–$\frac{2}{3}$ depth of the calyx, minutely ciliate on margin. Petals spreading or reflexed, imbricated in bud, longer than the lobes of the calyx. Fruit glabrous, ovate-conical, curved near apex and tapering into the style, 2 or 3 times as long as the calyx, to the tube of which it is adherent.

Upper Guinea. Old Calabar and Gaboon rivers, *Mann!*

2. **S. sericea,** *Hook. f. l.c.* Small tree, 20 ft. high with young branches silky. Inflorescence silky, axillary, panicled, spreading.

Leaves sub-opposite or alternate, shining especially on upper side, oval-oblong, acuminate, with margins neatly recurved, midrib and lateral veins silky beneath and in relief on both sides, somewhat cuneate at base, 4–6½ in. long. Petioles ⅓ in. long, silky, patent, thicker than midrib of leaves. Bracteoles about 1 line long, oblong, patent or declining, concave, silky. Pedicels about ⅛ in. long. Calyx with 4 or 5 shallow depresso-deltoid lobes. Petals white. Ovary partly inferior, glabrous, 1-celled, 2-ovuled.

Upper Guinea. Muni river, *Mann!*

11. **OLINIA,** Thunb.; Benth. et Hook. f. Gen. Plant. i. 785.

Calyx tubular, adhering to the ovary and exceeding it, truncate at apex, thickened, sinuous or obscurely dentate; the portion above the ovary deciduous. Petals 5, inserted at apex of calyx-tube, persistent, as long as the calyx. Scales 5, alternating with and interior to the petals, narrow, ultimately incurved, arising from top of calyx-tube. Stamens 5, opposite and just below the scales; filaments very short, adnate, reflexed and directing the short 2-celled anthers extrorsely; connective thickened. Ovary 3–5-celled, wholly inferior; cells few-ovuled; ovules pendulous from central column; style straight, club-shaped, included in calyx-tube; stigma blunt. Fruit drupaceous, 2–5-celled, subglobose, surrounded by lower portion of calyx; cells 1-seeded.—A shrub or small tree with opposite leaves and branches and terminal or subterminal inflorescence.

An anomalous genus, consisting of only one species including three varieties; it occurs also at the Cape, but not out of Africa.

"*Olinia Rochetiana*, A. Juss." Schweinfurth, Fl. Æthiop. 259, is said to occur in Abyssinia. It is probably identical with *O. cymosa*.

1. **O. cymosa,** *Thunb. in Röm. Arch.* ii. *Pars* i. 4 (1799). A nearly glabrous shrub 4–10 ft. high, branched from the base; branches acutely quadrangular, especially at the extremities. Leaves glabrous, shortly stalked or subsessile, oval, narrowed at the base, bluntly emarginate at apex, thinly coriaceous, deep green above, paler beneath, pellucidly net-veined, patent; margins somewhat incrassato-reflexed, scarcely wavy; 1–2½ in. long by ½–1¼ in. wide. Bracts and bracteoles imbricated over the flower in bud, deciduous, white, hairy. Flowers about ¼ in. long, with very sweet fragrance. Calyx sparingly pilose externally, glabrous internally, coriaceous. Petals white, panduriform, with a bunch of hairs inside near base, shorter than the calyx, quincuncial in æstivation. Scales converging and closing the tube of the calyx in bud, hooded, narrowly obovate, spreading in flower and subsequently incurved above the stamens. Style sparingly pilose; ovary usually 4-celled. Fruit red. Seeds oval; embryo spiral, cotyledons scarcely distinct.—Kl. Ic. Pl. Rar. 60, t. 24 (1841). *O. capensis*, Kl. l.c. 6. t. 3; *O. acuminata*, Kl. l.c. 21, t. 21.

Grows in rocky thickets.

Nile Land. Abyssinia, Ankober, fl. and fr. June, *Roth!*
Lower Guinea. Angola, Huilla, 5000 ft. alt., fl. December, *Dr. Welwitsch!*

Punica Granatum, L., the pomegranate, forming an anomalous genus, occurs occasionally as an escape from cultivation in Angola (Distr. Golungo Alto, Welwitsch! 2333), and is cultivated in Abyssinia, Sennaar, and Kordofan.

Order LIX. ONAGRARIEÆ. (By Prof. Oliver.)

Flowers usually hermaphrodite, regular, 4–5-merous (in trop. African species). Calyx-tube adnate to the ovary, sometimes produced more or less above; lobes valvate. Petals as many as calyx-lobes, fugacious, contorted or imbricate. Stamens usually as many or twice as many as calyx-lobes. Ovary inferior, usually 4- or- 2- celled; ovules axile, indefinite or solitary. Fruit a capsule, often thin or membranous, dehiscent by valves or irregularly, or (in *Trapa*) a nut. Seeds indefinite or solitary, exalbuminous or nearly so.—Herbs or rarely shrubs, often aquatic. Leaves opposite or alternate, entire or toothed, stipulate. Flowers axillary, usually solitary.

A considerable Order, common to both hemispheres, and most abundant in the North Temperate zone. No genera are peculiar to Africa; fourteen to America.

Seeds indefinite.
  Seeds comose . . . . . 1. Epilobium.
  Seeds not comose.
    Diplostemonous . . . . . 2. Jussiæa.
    Isostemonous . . . . . 3. Ludwigia.
Seed solitary. Fruit a horned nut. (Floating herb.) . . . . . 4. Trapa.

1. EPILOBIUM, Linn.; Benth. et Hook. f. Gen. Plant. i. 787.

Calyx-tube narrow, elongate, terete or tetragonous, not at all or scarcely produced above the ovary; limb 4-partite, deciduous. Petals 4, obovate or obcordate. Stamens 8; anthers oblong or linear. Ovary 4-celled; style filiform, stigma clavate, entire or 4-lobed; ovules ∞. Capsule narrow, dehiscing loculicidally by 4 valves from above. Seeds ∞, comose.—Usually herbs, erect or procumbent. Leaves opposite or alternate, simple, denticulate or entire. Flowers axillary, solitary or racemose, usually rose or purple.

A large genus of the North Temperate zone, with numerous outliers in New Zealand. Excepting *E. hirsutum*, the following may prove to be peculiar to Tropical Africa, though, with our present material, and without working up the extra-African species, I cannot at present feel clear as to this.

Stigma 4-partite, with recurved lobes. Uniformly pilose or hirsute . . . . . 1. *E. hirsutum.*
Stigma entire or at any rate not 4-partite. Glabrous, glabrescent, or pubescent only in decurrent lines and on the leaf-margin and nerve.
  Leaves ovate or ovate-lanceolate, base cordate, callous-denticulate. Capsule and peduncle 4–4½ in. . . . . 2. *E. cordifolium.*
  Leaves ovate-elliptical, callous-denticulate. Capsule and peduncle 1–1½ in. (Fl. subsessile.) . . . . . 3. *E. Schimperianum.*
  Leaves oblong-lanceolate, obtuse, minutely denticulate. Capsule and peduncle 2–4½ in. . . . . 4. *E. stereophyllum.*

1. **E. hirsutum,** *Linn.*; *DC. Prod.* iii. 42. Stem erect, 2–5 ft., terete, uniformly hirsute or pilose-pubescent. Leaves opposite or subopposite, linear-lanceolate, acuminate, serrulate with forward teeth, pubescent or pilose, sessile, amplexicaul, $1\frac{1}{2}$–5 in. long. Flowers sessile or peduncle very short, $\frac{1}{3}$–$\frac{3}{4}$ in. in expansion. Stigma 4-cleft, with linear or oblong at length revolute lobes. Capsule 2–3 in.—*E. foliosum*, Hochst. in Herb. Schimp. Abyss.

Nile Land. Abyssinia, *Schimper! Roth!* and others.
Mozamb. Distr. Ugogo (6° 44′ S. lat.), *Speke and Grant!*
Also at the Cape (*E. villosum*, Thunb.). Widely spread in the Eastern hemisphere.

2. **E. cordifolium,** *A. Rich. Fl. Abyss.* i. 274, t. 50. Stem erect, obtusely tetragonous or 4-sulcate when dry, with longitudinal decurrent puberulous lines below, uniformly puberulous above. Leaves mostly opposite, sessile or subsessile, ovate-oblong to ovate-lanceolate from a cordate base, acute, approximately callous-denticulate, thinly puberulous on the nerves and margin, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long. Flowers rather large from the upper axils on erect long pubescent peduncles. Ovary elongate narrow, hoary. Calyx-lobes linear acute, shorter than the obcordate petals. (Stigma apparently bipartite, with retuse or emarginate lobes.) Fruit with peduncles 4–$4\frac{1}{2}$ in. long.

Nile Land. Abyssinia, *Petit, Plowden!*

3. **E. Schimperianum,** *A. Rich. Fl. Abyss.* i. 272. Stem decumbent subterete sometimes leafless and transversely scarred below; extremities puberulous. Leaves rather crowded upwards, opposite, sessile or subsessile, elliptic-ovate, subacute, base obtuse, callous-denticulate, finely puberulous on the nerves beneath, $\frac{2}{3}$–1 in. long. Flowers axillary, subsessile, about $\frac{1}{2}$ in. in expansion. "Calyx-lobes lanceolate; petals oblong-obcordate, bilobed." Capsule slender puberulous, with peduncle 1–$1\frac{1}{2}$ in. long.

Nile Land. Abyssinia, *Petit, Schimper!*
The stigma appears lobate, but our specimens do not show it well. The species appears nearly allied to some Himalayan *Epilobia*.

4. **E. stereophyllum,** *Fresen. in Mus. Senck.* ii. 152. Stem 1–$2\frac{1}{2}$ ft., often decumbent and rooting towards the base, subterete or obtusely tetragonous, glabrous or glabrescent at least below excepting usually decurrent puberulous lines from the leaves. Leaves oblong-lanceolate, lower opposite, subsessile or petioles very short, the upper sessile and alternate, more or less obtuse, base of upper leaves rounded or even subcordate, minutely denticulate, glabrous or puberulous on margin and nervation beneath; 1–2 in. long. Flowers rather large from the upper axils, peduncles $\frac{1}{2}$–$2\frac{1}{2}$ in., like the ovary puberulous. Calyx-lobes oblong-lanceolate acute, $\frac{1}{3}$ in. Petals acutely 2-lobed. Stigma entire (or very shortly lobulate). Capsule $1\frac{1}{2}$–2 in.—*E. fissipetalum*, Steud.; A. Rich. Fl. Abyss. i. 273.

Nile Land. Abyssinia, *Rüppell, Schimper!*

2. **JUSSIÆA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 788.

Calyx-tube elongate cylindrical or prismatic, not produced above the ovary; limb 4–5-partite. Petals as many as calyx-lobes. Stamens twice as many as petals. Ovary 4–5-celled; ovules ∞. Capsule dehiscing septicidally or the thin pericarp irregularly rupturing. Seeds ∞, in some species singly enclosed in free at length dehiscing segments of the dry endocarp.—Herbs or frutescent. Leaves alternate, usually entire. Flowers yellow or whitish, axillary, solitary, sessile or pedunculate.

A considerable genus, affecting wet localities throughout tropical and subtropical countries. Many of the species are very widely diffused, and their synonymy is much entangled. I have not attempted to unravel this for the present purpose. The synonymy of some of the species is treated of by Grisebach (Flora British W. Indies), Bentham (Flora Australiensis, iii. 307), and Wright (in Journ. Linn. Soc. x. 476).

Creeping or floating herb . . . . . 1. *J. diffusa.*
Erect or ascending, not rooting at the nodes.
  Flowers 5-merous, usually hirsute above. Leaves lanceolate . . 2. *J. pilosa.*
  Flowers 4-merous.
    Glabrous. Seeds singly enclosed in dehiscent segments of endocarp . . . . . 3. *J. acuminata.*
    Usually hirsute above. Capsule $\frac{2}{3}$–$1\frac{1}{4}$ in. Seeds free, nearly round, compressed $\frac{1}{30}$–$\frac{1}{40}$ in. diameter . . . . . 4. *J. villosa.*
    Glabrous. Capsule $\frac{1}{2}$–$\frac{2}{3}$ in. Seeds free, oblong, $\frac{1}{60}$ in. long . 5. *J. linifolia.*

1. **J. diffusa,** *Forsk. Fl. Æg.-Arab.* 210. Creeping or floating herb, copiously rooting, frequently with cylindrical float-vesicles and aërial roots at the nodes, glabrous or pubescent. Leaves varying from linear-oval to lanceolate, obtuse or subacute, entire or obscurely sinuate, 1–3 in. long, narrowed into the petiole of variable length. Flowers pedunculate, usually 5-merous, $\frac{3}{4}$–$1\frac{1}{4}$ in. in diameter, yellow. Calyx-lobes linear-lanceolate, $\frac{1}{4}$–$\frac{1}{3}$ in. Petals exceeding the lobes. Capsule cylindrical, sulcate, $\frac{3}{4}$–$1\frac{1}{4}$ in. long on a peduncle as long or longer, with a pair of minute bracteoles near the junction.—*J. stolonifera,* Guill. et Perr. Fl. Seneg. i. 292. *J. fluitans,* Hochst., Harv. et Sond. Fl. Cap. ii. 504. *J. alternifolia,* E. Mey. in Hb. Drege.

Upper Guinea. Senegambia, *Perrottet.*
Nile Land. White Nile, *Dr. Brownell!* Kazé, 5° S. lat. (as *J. repens*), *Speke and Grant!* Abyssinia, *Schimper!*
Mozamb. Distr. Zambesi, *Dr. Peters!*
The true *J. repens* (of which this may be but a variety) with the upper leaves from oblanceolate to obovate, rounded at the apex, I have not seen from Tropical Africa.

2. **J. pilosa,** *H. B. K. Nov. Gen.* vi. 101, t. 532a. Branching herb or woody below, erect ascending or diffuse, attaining 3 ft. Stem at least towards the leafy extremities more or less hirsute, more rarely glabrate. Leaves lanceolate or linear-lanceolate, subacute or narrowed to an obtuse apex, gradually narrowed below into the petiole, usually more or less hirsute-pubescent at first, at length subscabrid-puberulous or glabrate above, $1\frac{1}{4}$–5 in. long. Flowers yellow, shortly pedunculate, $\frac{1}{2}$–$\frac{3}{4}$ in. diameter, 5-merous. Capsule cylindrical, 1–$1\frac{1}{2}$ in. long, on a

peduncle of $\frac{1}{10}$–$\frac{1}{2}$ in. Seeds oblong, subterete, each enclosed at first in an obovate compressed investment, bony within, of the endocarp.

Upper Guinea. Nigritania, *Barter!*
Nile Land. White Nile, 12° N. lat., *Dr. Brownell!* Marshes, 3° N. lat., and Nile banks, 10° N. lat. (as *J. villosa*), *Speke and Grant!*
Mozamb. Distr. Zambesi land, Shire valley, and elsewhere, *Dr. Kirk!*
Differs from *J. diffusa* in little but the erect or ascending (not rooting) habit.
Also in Tropical America.

3. **J. acuminata,** *Sw. Fl. Ind. Occ.* ii. 745. An erect simple or sparingly branched glabrous herb, from a few inches to 1–2 ft. Stem obtusely angled. Leaves membranous, ovate-lanceolate or lanceolate, distinctly petiolate, narrowed to an acute or subacute apex, base cuneate or slightly rounded narrowing into the petiole, entire, with 13–17 lateral veins curving forward on each side of the rather prominent midrib; 3–4 in. long, 1–1$\frac{1}{3}$ in. broad. Flowers yellow, small, about $\frac{1}{4}$ in. in diameter, tetramerous, shortly pedunculate or subsessile. Ovary and peduncle usually not exceeding $\frac{1}{2}$–$\frac{3}{4}$ in. Capsule narrow, apparently not exceeding $\frac{3}{4}$ in. in length. Seeds (at least the lower ones) each singly enclosed in ultimately dehiscent segments of endocarp.

Upper Guinea. Sierra Leone and Nigritania, *Barter! Dr. Baikie!* Gaboon, *Mann!*
Lower Guinea. Congo, *Burton!*
Mozamb. Distr. Zambesi, *Dr. Peters* (Klotzsch in Peters' Mossamb. Bot., 70. *ex. descr.*)
Also in Tropical America.

4. **J. villosa,** *Lam. Dict.* iii. 331. An erect branching herb from a few inches to 3 or 4 ft. in height. Stem firm, woody, often slender, terete, with raised decurrent lines or extremities subalate, more or less hirsute above, at least at the leafy extremities, usually glabrescent below, rarely so throughout. Leaves from narrow-linear to linear-lanceolate, acute, gradually narrowed to the base, usually without distinct petiole, $\frac{1}{2}$–5 in. long, frequently not exceeding 1–12th in. in breadth. Flowers small, subsessile, yellow, 4-merous. Capsule $\frac{2}{3}$–1$\frac{1}{4}$ (–2) in. long. Seeds nearly round, compressed, about $\frac{1}{3}$ line diameter.

α. (Leaves linear-lanceolate.)
Upper Guinea. Sierra Leone, *Barter!* Camaroons river, *Mann!*
Nile Land. Ukidi and Madi, Upper Nile, *Speke and Grant.*
Mozamb. Distr. Zambesi and lower valley of Shire, *Drs. Kirk and Meller!* Zanzibar, 7$\frac{1}{2}$° S. lat. (as *J. angustifolia*), *Speke and Grant!*

β. (Leaves narrow-linear.) *J. linearis,* Willd. Sp. ii. 575.
Upper Guinea. Senegambia! Bassa, *T. Vogel!* Abbeokuta, *Irving!* Confluence of Quorra and Tschadda (form with shorter hirsute linear leaves), *Barter!* I have not seen the Abyssinian plant cited by Richard.
Widely spread in tropical countries.

5. **J. linifolia,** *Vahl, Eclog. Amer.* 32. Erect with a firm but slender woody terete stem, marked with faint decurrent lines or very narrowly alate above, from a few inches to 2 ft. or more (8–10 ft.) in height, usually freely branched above, branches divaricate, wholly glabrous. Leaves linear-lanceolate, narrowed to each end, acute or subacute,

entire, 1–3 in. long; petiole variable, frequently narrowly margined to the base. Flowers small, yellow, sessile, 4-merous, often from nearly every axil. Capsule cylindrical or slightly narrowed below, $\frac{1}{2}$–$\frac{2}{3}$ in. long. Seeds minute, oblong or ellipsoidal, about $\frac{1}{5}$ line in length.—*J. altissima*, Guill. et Perr. Fl. Seneg. 293 (ex. descr.). *J. nubica*, Hochst. in Herb. Kotsch. Nub.

Upper Guinea. Quorra, *T. Vogel!* Senegambia, *Guill. et Perr., l.c.*
Nile Land. Between Khartoum and Schendy, *Dr. Bromfield!* Nubia, Sennaar, *Kotschy!*
Lower Guinea. Congo, *Consul Burton!*
Mozamb. Distr. Sungomero, Zanzibar, *Speke and Grant!*
Also in Tropical America.

3. **LUDWIGIA**, Linn.; Benth. et Hook. f. Gen. Plant. i. 788.

Characters of *Jussiæa*, but flowers isostemonous, the stamens same number as calyx-teeth.—Herbs, the African species with habit of *Jussiæa*.

A considerable genus, chiefly North American, with a few widely-diffused species in the Old World tropics.

Flowers $\frac{1}{2}$–1 in. diameter. Capsule 1 in. long, $\frac{1}{12}$ in. diameter . .	1. *L. jussiæoides.*
Flowers $\frac{1}{6}$–$\frac{1}{4}$ in. diameter. Capsule $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{12}$–$\frac{1}{6}$ in. diameter, narrowed into peduncle of $\frac{1}{12}$ in.	2. *L. parviflora.*
Flowers $\frac{1}{6}$–$\frac{1}{4}$ in. diameter. Capsule slender, subsessile, $\frac{1}{2}$–$\frac{3}{4}$ in. long, $\frac{1}{20}$ in. diameter	3. *L. prostrata.*

1. **L. jussiæoides,** *Lam.; DC. Prod.* iii. 58. Erect, varying in height to probably 2–3 ft., freely branched above. Stem subterete, with faintly raised decurrent lines, puberulous at the extremities. Leaves linear-oval or -lanceolate acute or subacute, narrowed below into the petiole, glabrous or scabrid on the nerves; blade and variable petiole together $1\frac{1}{2}$–4 in. long. Flowers axillary, 1 in. or less in diameter. Calyx-teeth $\frac{1}{4}$–$\frac{1}{3}$ in.; petals rotundate, exceeding the calyx-teeth. Capsule subcylindrical, 1 in. long, $\frac{1}{12}$ in. diameter on peduncle of $\frac{1}{6}$ in., more or less.—DC. Mém. Onagr. t. 3.

Mozamb. Distr. Zanzibar, *Dr. Kirk!*
Also in the Mascarene Islands.

2. **L. parviflora,** *Roxb.; DC. Prod.* iii. 59. Erect, freely branching or subsimple, from a few inches to 2–3 ft. in height, wholly glabrous or with a few microscopic setulæ on the leaf-nerves. Stem subterete below, with decurrent lines. Leaves from narrow-linear to linear-lanceolate, gradually narrowed into the petiole, 1–3 (4) in. long. Flowers axillary, $\frac{1}{4}$ in. or less in diameter. Calyx-teeth $\frac{1}{8}$–$\frac{1}{6}$ in. Capsule narrowed below, $\frac{1}{4}$–$\frac{1}{2}$ in. long, $\frac{1}{12}$–$\frac{1}{6}$ in. diameter above, usually with a distinct peduncle of $\frac{1}{12}$ in. Seeds 1–50th to 1–60th in. long.—*Isnardia multiflora*, Guill. et Perr. Fl. Seneg. i. 295 (ex. descr.). *Ludwigia*, Walp. Rep. ii. 75.

Upper Guinea. Senegambia, *Guill. et Perr.* (with flowers occasionally 5-merous, and stamens sometimes twice as many as usual).
Nile Land. Unyoro, *Speke and Grant!*
Also in Tropical Asia and Australia.

3. **L. prostrata,** *Roxb.; DC. Prod.* iii. 59. Diffuse ascending or erect, glabrous; stem somewhat angular. Leaves lanceolate or linear-lanceolate, acuminate, 2–4 in. long, narrowed at base into petiole of $\frac{1}{4}$ in. more or less, sometimes minutely setulose-ciliate. Flowers small, $\frac{1}{6}$–$\frac{1}{4}$ in. in diameter; petals oval or lanceolate. Capsule tetragonous longitudinally grooved, subsessile, $\frac{1}{2}$–1 in. long, 1–20th in. in diameter. Seeds about 1–30th in. long.—*L. diffusa,* Ham. in Linn. Trans. xiv. 301.

Nile Land. Abyssinia, *Dillon.* (*L. abyssinica,* A. Rich. Fl. Abyss. i. 274 (*ex. descr.*)

Mozamb. Distr. Moramballa, 3000 ft. alt., *Dr. Kirk.*

Occurs in India and the Mascarene group.

M. De Candolle based his genus *Prieurea* (*P. senegalensis*) on a *Ludwigia* or *Jussiæa,* with flowers frequently 3-merous, collected by Leprieur in Senegambia (Mém. Onagr. 14, t. 2). Guillemin and Perrottet reduce it to *Jussiæa* with doubt. I have not seen a specimen. From the figure and description it would appear not improbably a state of *Jussiæa linifolia.*

4. TRAPA, Linn.; Benth. et Hook. f. Gen. Plant. i. 793.

Floating herbs. Calyx-limb 4-partite, segments persistent accrescent, often spinescent. Petals 4, inserted at base of an epigynous disk. Stamens 4. Ovary 2-celled, upper free portion conical, narrowed into the style; stigma capitate; ovules solitary, pendulous. Fruit turbinate, bony or coriaceous, horned with 2 or 4 of the persistent calyx-teeth, 1-celled, 1-seeded. Cotyledons very unequal, radicle incurved, penetrating the apex of the fruit on germination.—Leaves dimorphic; submersed root-like, pinnatipartite with filiform segments; emersed rosulate rhomboidal dentate on outer margins, petiolate; petiole dilated below the lamina.

A small genus extending eastward through Asia from Central Europe. The farinaceous seeds are collected as food.

Nuts 4-cusped.	Leaves glabrescent	1. *T. natans.*
Nuts 2-horned.	Leaves tomentose beneath	2. *T. bispinosa.*

1. **T. natans,** *Linn.; DC. Prod.* iii. 63. Rosulate leaves varying usually from 1–2 in. in breadth, base broadly cuneate, outer margins dentate or inciso-dentate, glabrous above, glabrescent or papillose-tomentose on the nerves beneath; petioles glabrescent. Nuts with 4 short broad-based cusps or horns; 1 in. broad more or less.

Nile Land. Upper Nile, 2° N. lat. *Speke and Grant!*

Also in Central Europe and Temperate Asia.

2. **T. bispinosa,** *Roxb.; DC. Prod.* iii. 64. Similar to the foregoing. Leaves varying to nearly 3 in. in breadth, generally more or less uniformly appressed-tomentose beneath as are the petioles. Nuts with 2 slender patent lateral horns, the intermediate teeth undeveloped or scarcely prominent, apex shortly apiculate with the persistent style-base.

Mozamb. Distr. Zambesi, floating down in large quantities by the Shire in flood, and Luabo, *Dr. Kirk!*

Also in India.

Order LX. **SAMYDACEÆ.** (By Dr. Maxwell T. Masters.)

Flowers regular, hermaphrodite. Flower-tube coriaceous, adnate to or separate from the ovary. Sepals 3–7, persistent, imbricate or valvate. Petals equal in number to the sepals or rarely more numerous, usually similar to them and springing from the throat of the flower-tube, marcescent accrescent or sometimes absent. Disk perigynous or hypogynous, cup-like; annular or glandulose. Stamens definite or indefinite in one or many rows, alternating with an equal number of staminodes, or grouped in fascicles opposite to the petals; filaments thread-like distinct or connate below into a tube; anthers didymous oblong, bursting inwardly by two chinks. Ovary free or attached to the base of the flower-tube, sessile, 1-celled, surmounted either by a single consolidated style, which is entire or 3-fid at the summit, or more rarely by 3–5 distinct styles; stigmas simple or capitate. Ovules few or numerous attached to 3–5 parietal placentas often near the upper end of the ovarian cavity only; anatropous, pendulous or ascending; micropyle superior; raphe lateral or ventral. Fruit capsular or indehiscent, coriaceous or fleshy, 1-celled, 1- or many-seeded, partially or completely 3–5-valved, valves alternating with the placentas. Seeds few, oblong or angular, ascending or pendulous with a central or lateral hilum; arillus fleshy entire or torn; testa crustaceous or coriaceous, black, striate or rugose. Albumen abundant fleshy. Embryo axile, shorter than the albumen; cotyledons oblong, orbicular or cordate, often foliaceous; radicle very short or elongate, terete.—Trees or shrubs, glabrous pubescent or tomentose. Leaves stalked, simple, alternate, distichous, often with pellucid circular and linear spots, entire or serrate, teeth often glandular. Stipules small, often deciduous or wanting, rarely leafy. Flowers inconspicuous, racemose panicled or tufted, stalked; pedicels jointed, bracteolate.

An Order whose members are for the most part natives of the Tropics of both hemispheres.

Tribe 1. **Caseariеæ.**—*Leaves alternate. Calyx* 4–5-*merous. Petals none. Stamens* 6–15. *springing from the margin of the flower-tube in a single row. Staminodes equal in number to the fertile stamens, and alternating with them.*

Stamens 6–15, combined into a tube below. Style simple, 3-lobed or entire at the apex. Flowers tufted . . . . . 1. Casearia.

Tribe 2. **Banareæ.**—*Leaves alternate. Calyx free,* 4–5-*merous. Petals* 4–5 *or more. Stamens numerous, in many rows, springing from a perigynous disc.*

Calyx 3-parted, imbricate. Petals 7–10. Stamens short. Leaves entire. Flowers in short spikes . . . . . 2. Pyramidocarpus.

Tribe 3. **Homalieæ.**—*Leaves alternate. Flower-tube free or more or less adnate to the ovary. Sepals and petals,* 4–15 *distinct. Stamens equal in number to the petals, opposite to them, or more numerous and collected in tufts in front of them, alternating with glands placed opposite to the sepals.*

* Ovary free.

Petals equal in number to the sepals. Stamens more numerous. Seeds covered with cottony hairs . . . . . 3. Bivinia.

Petals twice as many as the sepals. Stamens very numerous.
Filaments pilose . . . . . 4. DISSOMERIA.
** Ovary more or less adherent.
Petals flat, as many as the sepals . . . . . 5. HOMALIUM.
Petals hooded . . . . . 6. BYRSANTHUS.

1. **CASEARIA,** Jacq.; Benth. et Hook. f. Gen. Plant. i. 796.

Flower-tube short; sepals 4–6, imbricate. Petals wanting. Staminal tube short, emerging from near the base of the flower-tube, divided at its upper margin into 10 fertile stamens and as many barren staminodes. Ovary free, ovoid; style simple, short; stigmas capitate; ovules numerous. Capsule 3–4-valved, valves bearing the seeds in the middle. Seeds oblong, with a fleshy aril; albumen fleshy; embryo straight; cotyledons flat; radicle terete.—Trees or shrubs. Leaves distichous, alternate, simple, coriaceous, often marked with linear or circular translucent spots. Stipules minute. Flowers tufted, small.

A large genus, pretty uniformly represented in the Tropical regions of both hemispheres and in Australia. The African species are few in number, and hitherto undescribed.

Flowers in stalked glomerules . . . . . 1. *C. stipitata.*
Flowers in sessile glomerules.
Leaves distinctly oblique at the base.
Leaves lanceolate. Staminodes roundish, short . . . . 2. *C. gladiiformis.*
Leaves oblong. Staminodes ribbon-like, as long as the filaments . . . . . 3. *C. prismatocarpa.*
Leaves not oblique at the base, or but slightly so.
Pedicels longer than the bracts. Ovary longer than the stamens . . . . . 4. *C. Mannii.*
Pedicels scarcely longer than the bracts. Ovary shorter than the stamens . . . . . 5. *C. Barteri.*

1. **C. stipitata,** *Mast.* A small tree (20 ft.), the younger branches puberulous. Leaves glabrous, subcoriaceous, or with a few weak hairs along the nerves on the lower face, oblong, entire, rounded or obtuse at the base, shortly acuminate, 5–6 in. long, 2–2½ in. wide. Petioles very short. Flowers numerous, in dense, stalked axillary clusters; stipes shorter than the petiole. Sepals leathery. Staminodes flat, ribbon-shaped, pilose, nearly equalling the glabrous fertile stamens in length; anthers small, ovate, pointed. Ovary 3-lobed; style short; stigma capitate.

Upper Guinea. Aboh, Niger, *Barter!*

2. **C. gladiiformis,** *Mast.* A tree with greyish bark. Leaves subcoriaceous, glabrous, with circular and linear pellucid spots, lanceolate, tapering at both ends, oblique at the base, sometimes acuminate at the apex, 5–6 in. long, 2 in. wide. Petiole scarcely an inch in length. Flowers numerous in dense, sessile clusters in the axils of the fallen leaves; flower-buds subglobose, slightly villose, as also are the short pedicels. Sepals oblong, obtuse, concave, membranous at the margins. Staminal tube dividing about half-way up into 10 short fertile and as many sterile stamens; fertile filaments glabrous, anthers

oblong-acute, apiculate; staminodes short, sub-orbicular, downy. Ovary oblong, slightly villose; style short; stigma capitate.

Mozamb. Distr. Shupanga, Zambesi, *Dr. Kirk!*

3. **C. prismatocarpa,** *Mast.* A tree with smooth, cylindrical, purplish branches. Leaves coriaceous, glabrous, not dotted, oblong, acute, rounded and oblique at the base, entire or obsoletely toothed at the margin; sometimes revolute, 5–6 in. long, $2\frac{1}{2}$ in. wide. Petiole less than $\frac{1}{2}$ in. long. Flowers numerous, pedicellate, pedicels slightly villose, arranged in dense, sessile, axillary clusters. Sepals coriaceous, thin at the edges, oblong-obtuse, hooded. Staminal tube shorter than the calyx, dividing above the middle into 10 fertile and as many sterile stamens, the latter ribbon-like, pilose, as long as the fertile filaments. Ovary oblong; style short; stigma capitate. Fruit coriaceous, indehiscent, 1-celled, oblong, acute, somewhat five-lobed, 5 or 6 times longer than the persistent deflexed calyx.

Upper Guinea. Gaboon river and Muni river, lat. 1° N., *Mann!*

4. **C. Mannii,** *Mast.* A shrub or small tree (20 ft.), with smooth or wrinkled ash-coloured bark, and obliquely ascending slender branches. Leaves membranous, glabrous, dotted with circular translucent spots, oblong, entire, acuminate, 4–5 in. long, $1\frac{1}{2}$–2 in. wide, tapering at the base into a very short petiole. Flowers stalked; pedicels short, in few-flowered sessile axillary clusters; flower-buds ovoid. Sepals coriaceous, ovate, obtuse, distinct to the base or nearly so, ultimately reflexed. Staminal tube very shallow, speedily dividing into 10 fertile glabrous filaments and 10 ribbon-like pilose staminodes as long as the filaments; anthers ovoid, pointed. Ovary oblong, obscurely 5-lobed, glabrous unless at the apex, exceeding the stamens in length; style short; stigma capitate. Fruit oblong, acute, sometimes pyriform, coriaceous, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, less than 1 in. wide, tapering at the base into a pseudo-stipes which is girt by the persistent reflexed perianth; seeds ovoid with a scarlet arillus.

Upper Guinea. Princes Island, *Mann! Barter!*

5. **C. Barteri,** *Mast.* A shrub or tree with terete or subangular, smooth, purplish branches. Leaves coriaceous, glabrous, oblong, tapering at the base into a short petiole, acute or acuminate, impunctate, 5–6 in. long, 2 in. wide. Pedicels glabrous, arranged in sessile clusters in the axils of the fallen leaves, and invested by small bracts. Sepals coriaceous, oblong, hooded, $\frac{1}{4}$ in. long. Staminal tube dividing above into 10 fertile stamens and 10 hairy oblong obtuse staminodes half the length of the fertile filaments. Ovary sessile, oblong, smooth; styles very short; stigma capitate.

Upper Guinea. Onitsche, Niger, *Barter!* Ambas Bay, *Mann!*

C. guineensis, *Don, Gard. Dict.* ii. 53. "Flowers 5-cleft, 10-anthered; leaves ovate-lanceolate, acuminate, serrated, 3-nerved at the

base, very villous as well as the branches; peduncles many-flowered, crowded, axillary; flowers green."

Upper Guinea? *Don.*

The above description is taken from the work cited. I have seen no specimen of the plant.

2. **PYRAMIDOCARPUS**, Oliv.; Benth. et Hook. f. Gen. Plant. i. 798.

Flowers hermaphrodite. Flower-tube very short; sepals 3, imbricate, orbicular, concave, leathery, passing into the petals. Petals 7–10, of the same form as the sepals, gradually decreasing in size from without inward, and passing into the stamens, the 3 or 4 innermost prolonged at the apex, erose. Stamens 20–30 in many rows, short, perigynous; anthers oblong; connective flat. Ovary 3-gonous, pyramidal, 1-celled, 3-angled at the top; stigma minute, 3-fid; ovules very numerous, affixed in many rows to three parietal placentæ. Fruit large, leathery, thick, cubical or pyramidal, thickened and bluntish at the angles, carinated on the surfaces, 3–4-valved, few-seeded; style short. Seed large, oblong or roundish, angular; testa crustaceous, surrounded by thin pulp; albumen fleshy. Embryo. . . .—A small tree with terete branches, annulate above the insertion of the leaves, which latter are alternate, coriaceous, oblong, stalked; leaf-stalks thickened at the apex. Flowers small, in short axillary spikes; fruit of the size of a hazel-nut.

The following is the only species described.

1. **P. Blackii,** *Oliv.; Journ. Linn. Soc.* ix. 171. A small tree 25 ft. high, with glabrous cylindrical branches. Leaves alternate, stalked, coriaceous, glabrous, oblong-elliptical, rounded at the base, cuspidate, minutely denticulate, 6–8 in. long, $2\frac{1}{2}$–$3\frac{1}{2}$ in. wide; stalk 5–9 lines long, thickened at the apex; stipules caducous. Flower-buds globular, spherical, arranged in dense, axillary, shortly stalked spikes, $\frac{1}{2}$–1 in. long; bracts minute. Fruit keeled at the dorsal suture.

Upper Guinea. River Muni, *Mann!*

The specimens in the herbarium have immature flowers only, hence there is nothing to be added to the above account copied from Prof. Oliver's description above cited.

3. **BIVINIA**, Tulasne; Benth. et Hook. f. Gen. Plant. i. 800.

Flowers hermaphrodite, monochlamydeous. Flower-tube very short. Sepals 5–6 ovate, acute, valvate. Stamens 40–60, emerging from the base of the flower-tube, arranged in bundles alternating with the sepals; filaments thread-like; anthers subglobose minute. Disk rather thick, lining the flower-tube and dividing at its throat into five oblong-obtuse pilose lobes (staminodes) placed opposite to the sepals. Ovary free or nearly so, oblong or subglobose, 3-lobed, 1-celled, with numerous anatropal ovules attached to 4–6 parietal placentas; styles 4–6 alternate with the placentas, persistent, ultimately cleft into two

divisions; stigmas obtuse. Capsule ovoid, coriaceous, loculicidally 4–6-valved, valves bearing the seeds in their centre. Seeds ovate-oblong, covered with long white cottony hair; tegmen subcrustaceous, albumen fleshy; cotyledons ovate, acute. Radicle terete.—A shrub with alternate, distichous, stipulate, stalked, entire leaves. Flowers small, in long, slender axillary racemes. Bracts linear.

1. **B. Jauberti,** *Tulasne in Ann. Sc. Nat. sér.* 4, viii. (1857), 78. A shrub with cylindrical glabrous branches, dotted with white spots, the younger shoots covered with ashy or brownish down. Leaves distichous, alternate, ovate or ovate-lanceolate, acuminate, tapering at the base, 3–4 in. long, 1½ in. broad, obscurely crenate-dentate, teeth minutely glandular, slightly pilose, especially along the nerves. Petiole less than an inch long, pilose. Flowers numerous, densely crowded on solitary, axillary, erect racemes, 2–6 in. long. Bracts linear. Pedicels articulate pilose. Calyx subglobose or campanulate, pilose. Anthers subglobose. Ovary globose, covered with greyish down. Styles 4–6 terete. Capsule oblong-globose, obscurely 3-lobed, covered with greyish down; valves terminated by two awns from the splitting of the styles. Embryo straight axile; cotyledons 2, small, ovate, flat, appressed.

Mozamb. Distr. Rovuma river, *Dr. Kirk!*
The species also occurs in Madagascar.

4. **DISSOMERIA,** Benth.; Benth. et Hook. f. Gen. Plant. i. 800.

Flowers dichlamydeous hermaphrodite. Flower-tube short. Sepals 4, imbricate, ovate, acute. Petals 8, in two rows, persistent, twice the length of the sepals, alternating with as many glands. Stamens 20–30, emerging from the base of the flower-tube, arranged in bundles opposite to the petals; filaments thread-like pilose; anthers subglobose. Ovary hirsute, free or nearly so, oblong, 1-celled; style short, dividing into three long, pilose, filiform branches; ovules few, attached near the top of the ovary to 3 or 4 parietal placentas. Fruit coriaceous indehiscent.—A shrub with alternate, stalked glandular-crenate leaves. Stipules falciform deciduous. Flowers in long axillary spikes.

1. **D. crenata,** *Benth. Fl. Nigrit.* 362. A shrub with warted branches; young shoots puberulous. Leaves alternate on short stalks, subcoriaceous, ovate, irregularly crenate undulate or repand, crenatures often minutely glandular, acute or obtuse at the base, feather-veined, reticulate, with tufts of hair on the lower face in the axils of the veins. Stipules caducous, linear, foliaceous, 2 lines long. Flower-spikes 3–5 in. long, in the axils of the upper leaves. Flowers interrupted, sessile, lower ones scattered, upper ones approximate; each subglobose, 5 lines in diameter. Bracts 3, brown, membranous, one central, two lateral smaller. Sepals 3 lines long, ovate, obtuse, connate at the base into a shallow tube, subcoriaceous, puberulous. Petals similar to the sepals,

but twice as large, persistent and connivent around the fruit. Glands small, broad, inserted with the petals. Stamens in fascicles of 6 before each petal; filaments filiform, covered with long spreading hairs, equal to or longer than the petals. Ovary densely hirsute, styles exserted.

Upper Guinea. At the confluence, on the banks of the Niger, *Ansell!*

5. **HOMALIUM,** Jacq.; Benth. et Hook. f. Gen. Plant. i. 801.

Flowers dichlamydeous, hermaphrodite. Flower-tube turbinate adnate to the base of the ovary. Sepals 5–6–7, persistent. Petals 6–7, emerging from the throat of the calyx, linear-oblong, flat, persistent. Stamens equal in number to the petals and opposite to them, or in greater numbers arranged in fascicles opposite to them, alternating with as many glands; filaments thread-like; anthers small, didymous. Ovary partly adherent; styles 2–5, thread-like; stigmas simple or capitellate. Ovules numerous or few, attached to 2–5-parietal placentas. Capsule partly adherent, coriaceous, 2–5-valved, few-seeded. Seeds angular or oblong; testa crustaceous; albumen fleshy, cotyledons leafy.—Trees or shrubs. Leaves alternate, stalked, ovate or lanceolate, glandulose, crenate or serrate. Stipules small. Flowers small in slender axillary branched panicles.

A genus whose members exist in Asia, Northern Australia, the Feejee islands, and Tropical America. The following are the only representatives of the Order on the continent of Tropical Africa, though others exist in Madagascar and Mauritius.

Stamens solitary before each petal.
- Stipules minute. Petals 3 or 4 times longer than the sepals.
  - Leaves entire. Panicle dense . . . . . 1. *H. longistylum.*
  - Leaves serrated. Panicle lax . . . . . 2. *H. africanum.*
- Stipules large, leafy. Petals twice the length of the sepals . 3. *H. stipulaceum.*

Stamens 2–7 before each petal . . . . . 4. *H. angustifolium.*

1. **H. longistylum,** *Mast.* A small tree with rugose, lenticillate, greyish bark. Leaves glabrous, subcoriaceous, oblong, tapering at the base into a very short petiole, abruptly acuminate, minutely serrulate, 2–3 in. long, 1–1½ in. wide. Stipules caducous. Flowers numerous, shortly pedicellate, in dense axillary and terminal much-branched panicles not greatly exceeding the leaves in length. Peduncles and pedicels puberulous. Bracts setaceous, deciduous. Flower-tubes turbinate, rather downy. Sepals 5, leathery, downy, triangular, pointed. Petals 5, oblong, obtuse, 2–3 times longer than the sepals, rather downy. Glands small. Stamens 5, about half the length of the petals. Ovary pilose; ovules numerous, pendulous from the upper ends of 3–5 parietal placentas; style cylindrical, as long as or longer than the stamens, dividing into 5 recurved stigmatic branches.

Upper Guinea. Corisco Island, lat. 1° N., *Mann!*

2. **H. africanum,** *Benth. in Journ. Linn. Soc.* iv. 35. A middle-sized tree with smooth cylindrical branches, the younger shoots puberulous. Leaves on very short stalks, coriaceous, glabrous, oblong, rather obtuse, cordate or rounded at the base, undulate-crenate, serrate, 6–8 in. long,

2–3 in. wide. Stipules linear, caducous. Flowers minute, 1½–2 lines in diameter, shortly pedicellate, arranged in clusters along the sides of a puberulous terminal panicle whose branches equal or exceed the leaves in length. Flower-tube puberulous, turbinate, limb divided into five triangular, acute, valvate segments. Petals 5, spathulate, apiculate, slightly downy, two or three times longer than the sepals. Glands small, wide, downy. Stamens 5, rather shorter than the petals; filaments glabrous; anthers minute, subglobose. Ovary rather downy; style rather conical, much shorter than the petals. Fruit . . . —*Blackwellia africana*, Hook. f. Fl. Nigrit. 361.

Upper Guinea. Lagos, Niger, *Barter!* Fernando Po, *Mann!* Sierra Leone, *Don! Afzelius! Smeathmann!* Senegal, *Heudelot!*

3. **H. stipulaceum,** *Welw. in Herb.* A small tree with terete branches covered, when young, with rusty down. Leaves alternate, coriaceous, smooth above, downy beneath, oblong-lanceolate, subcordate or rounded at the base, acuminate, serrate, 4–5 in. long, 2 in. wide. Petiole downy, ¼–½ in. long. Stipules foliaceous, falcate, as long as the leaf-stalks. Flowers 2–3 lines in diameter, placed on very short downy pedicels, arranged in terminal much-branched panicles, whose branches are as long as or longer than the leaves. Flower-tube urceolate, very short, downy, divided into 4–5 rather thick triangular lobes. Petals 5, coriaceous, oblong, obtuse, twice the length of the sepals. Glands 5, downy, flat, subtriangular, alternate with the petals, emerging with them from the mouth of the tube of the flower. Stamens 5, shorter than the petals; filaments slender, curved inwards in the bud. Ovary partially adherent; style short, conical, dividing into 4–5 branches opposite to the petals.

Upper Guinea. Bagroo river, *Mann!* Sierra Leone, *Afzelius!*
Lower Guinea. Angola, *Dr. Welwitsch!*

4. **H. angustifolium,** *Smith ex DC. Prod.* ii. 54. A shrub or small tree; younger branches puberulous. Leaves membranous, glabrous, except along the midrib on the under surface, lanceolate or oblong, acuminate, tapering at the base into a very short petiole, entire or undulate, and minutely serrate, 2–3 in. long, 1 in. wide. Flowers numerous, in dense spikes which scarcely exceed the leaves in length. Flower-tube turbinate. Sepals leathery, oblong, half the length of the broadly oblong petals. Stamens in parcels of 3 or more before each petal; filaments slender; anthers minute, didymous. Glands of disk distinctly cushion-shaped, one before each sepal. Ovary half-inferior, free portion villose; style half the length of the petals; stigmas 5.

Upper Guinea. Sierra Leone, *Afzelius! Smeathmann!*
Called by the natives "Maqueequee," according to Afzelius.

6. **BYRSANTHUS,** Guill.; Benth. et Hook. f. Gen. Plant. i. 800.

Flower-tube obconical, more or less adnate to the ovary; lobes of calyx 5–6, reflexed. Petals 5–6, leathery, similar to the calyx-lobes,

connivent or spreading, inflexed at the margins. Stamens 15, springing from the top of the flower-tube, intermingled with glands, and in two rows, the outer series so arranged that two stamens are placed one on each side of each petal, with a gland between them (*i.e.* opposite the centre of the petal); the inner series so disposed that one fertile stamen is placed in front of the centre of each petal, on the inner side of the gland in that situation, and itself flanked on either side by a gland, filaments thread-like; anthers didymous. Ovary partly adherent, 1-celled; styles 5, more or less connate below. Ovules numerous, attached to five parietal placentas. Capsule 1-celled, 1-seeded by abortion. Seed ovoid; albumen fleshy; cotyledons sub-reniform, foliaceous; radicle terete, thick.—Shrubs with alternate petiolate coriaceous exstipulate leaves. Flowers ash-coloured, in spikes or racemes. —*Anetia*, Endl. Gen. 923.

This genus was established by Guillemin, in Delessert's Icones, upon a plant discovered at the Gambia by Heudelot, and considered to be the same as one referred to, but not named, by R. Brown, in Tuckey's Congo. There seems to be no doubt that the plant of Guillemin is congeneric with that of Brown, but not specifically identical. The thick fleshy hooded petals of the same size or nearly so as the sepals and the double series of glands, are the main distinctive features between this genus and *Homalium*, to which, perhaps, when more ample evidence is obtained, it may be referred as a section.

Petals connivent.	Ovary adherent at the base only	1. *B. Brownii.*
Petals spreading.	Ovary completely adherent	2. *B. epigynus.*

1. **B. Brownii,** *Guill. in Delessert, Ic.* iii. 30, t. 52. A shrub with tortuous rugose branches. Leaves on very short stalks, leathery, glabrous on both surfaces, oval-oblong, feather-veined, undulate at the margin. Flowers in spikes at the end of the branches and in the axils of the leaves, small, ash-coloured, puberulous. Flower-stalks thick terete, rugose, transversely wrinkled. Bracts minute, ovate, acute. Tube obconical adherent to the base of the ovary. Sepals 5, leathery, greyish, puberulous, about 4 lines long, lanceolate, reflexed. Petals similar to the sepals, but erect and with infolded margins. Filaments equalling the petals; anthers roundish, dehiscing at the sides by a longitudinal chink. Styles 5, connate below into a fusiform tube, free above. Placentas lining the upper half of the ovary, the lower half destitute of ovules. Funicle slender, curved, dilated at the extremity. Fruit capsular, surrounded by the remains of the flower, one-seeded by abortion. Seed ovate, hanging from the apex of the ovarian cavity, and filling it; radicle erect.

Upper Guinea. Gambia, *Heudelot.*

This is the plant described by Guillemin, and considered by him to be identical with the one mentioned in Brown's Congo, but which belongs to the following species. The above description is condensed from that of Guillemin, as I have seen no specimen.

2. **B. epigynus,** *Mast. in Journ. Linn. Soc. ined.* A shrub or tree, with brown bark, thickly lenticellate. Leaves coriaceous, 4 in. long, $1\frac{1}{2}$–$2\frac{1}{2}$ in. wide, glabrous, oblong, obtuse, smooth on both surfaces, entire or nearly so. Petioles $\frac{1}{2}$ in. long. Inflorescence axillary, ra-

cemose; rachis twice the length of the petiole. Flower-tube cup-shaped, longer than the 5 deltoid valvate downy calyx-lobes. Petals 5 ovate, acute, very thick, valvate or slightly infolded at the margins, hooded at the apex, spreading slightly, exceeding the sepals. Filaments rather shorter than the petals, thread-like, incurved and often spirally twisted in æstivation; anthers globose, didymous; connective slightly prolonged. Ovary completely adherent to the flower-tube, 1-celled, many-ovuled; styles 5, awl-shaped, distinct to the base, and shorter than the stamens.

Upper Guinea. Gambia, *Park.*
Lower Guinea. Congo, *Chr. Smith!*

This no doubt is the plant intended by Brown, as it occurs in Prof. Smith's herbarium. It differs from the preceding in the spreading petals, completely inferior ovary, and other minor points. I have not seen Park's specimen, but judging from the habitat I consider it possible that that may belong to the former species, which is known to be a native of the Gambia.

Order LXI. LOASEÆ. (By Dr. Maxwell T. Masters.)

Flowers regular, dichlamydeous, hermaphrodite. Flower-tube adnate to the ovary, 10-ribbed; limb 5-lobed; lobes persistent. Petals 10, in two rows, perigynous. Stamens indefinite, arranged in five parcels; anthers 2-celled, introrse, opening longitudinally; staminodes petaloid or none. Ovary inferior, 3-celled, free at the apex; style filiform. Ovules solitary in each cell of the ovary (in the African species), anatropal, pendulous from the apex of the cavity. Fruit dry, 1–3-celled, 1–3-seeded. Seed exalbuminous; embryo straight; radicle superior; cotyledons flat, thick.—Bristly undershrubs or (climbing) herbs, with flowers in cymes.

A family the whole of whose species are natives of Tropical and subtropical America, except the one hereunder described.

1. KISSENIA, R. Br.; Benth. et Hook. f. Gen. Plant. i. 803.

Flower-tube bristly, 10-ribbed; limb 5-parted; lobes leafy, oblong, persistent, and enlarged in fruit. Petals 10, deciduous, attached in two rows to the throat of the flower-tube, 5 outer alternate with the sepals, roundish or obovate, concave, slightly keeled at the back; 5 inner smaller, opposite to the sepals, linear-oblong, bent in the middle. Stamens numerous, in five phalanges? inserted with the petals; filaments thread-like; anthers didymous. Ovary inferior, 3-celled. Ovules 1 in each cell, pendulous from the apex. Style filiform, spirally twisted near the top. Fruit bristly, 10-ribbed, surmounted by the persistent calyx-lobes, 2–3-celled with fibrous partitions. Seed solitary in each compartment, compressed or slightly convex on both surfaces; testa membranous, veined, rough; embryo straight; cotyledons leafy, thick; radicle very short, superior.—An undershrub, covered with rough, stinging bristles. Leaves exstipulate, alternate, stalked, irregularly pinnately lobed. Flowers in terminal leafy cymes.—*Fissenia* (errore),

R. Br. mss. ex. Endl. Gen. Pl. Supp. ii. 76; *Cnidone*, E. Meyer, Hb. Cap. Drege.

1. **K. spathulata,** *R. Br. mss.; T. Anderson, Flor. Aden.* 43. A rigid, much branched, bristly undershrub; branches striated, yellowish. Leaves on short stalks, subcoriaceous, pale, lower ones 5–7-lobed, 2–3 in. long, coarsely toothed ribbed and veined, the upper ones gradually smaller and less lobed, passing at the summit into lanceolate bracts. Flowers numerous, subsessile in a dense terminal scorpioid cyme. Flower-tube ovoid-oblong, rough with coarse spreading bristles; lobes leafy, oblong, obtuse, flat, entire, parallel-veined, much enlarged after flowering. Petals shorter than the sepals, the inner strap-shaped, bidentate or entire, bent above the middle. Staminodes linear, dilated and cordate at the base (or absent?). Style filiform, simple, twisted at the apex. Fruit indehiscent, oblong, obtuse.—*Fissenia capensis*, Endl. l. c.; Harv. Thes. Cap. t. 98; *Cnidone mentzelioides*, E. Mey. Plant. Hb. Drege.

South Central. Lat. 23° S., *Chapman and Baines!*

This singular plant occurs also in Namaqualand and at Aden. The description of the flower is mostly taken from Endlicher, as I have only examined imperfect specimens in a fruiting condition. The details of the floral construction are given differently by various authors, but the discrepancy in their statements does not apparently arise from the existence of more than one species.

Order LXII. TURNERACEÆ. (By Dr. Maxwell T. Masters.)

Flowers dichlamydeous, hermaphrodite, regular. Calyx tubular, 5-toothed, deciduous, lobes imbricate. Petals 5, springing from the calyx-tube, membranous, unguiculate, sometimes provided with a scale or tuft of hairs on the stalk. Stamens 5, springing from the base of the calyx-tube; filaments free; anthers oblong, 2-celled, introrse. Ovary superior, oblong, 1-celled, with three parietal placentas; styles 3, terminal, filiform; stigmas fringed. Ovules numerous, ascending, anatropal. Capsule 1-celled, bursting loculicidally from above downwards into 3 valves, each of which bears a many-seeded placenta on its centre. Seeds oblong cylindrical, straight or curved, stalked, partially invested by a membranous aril; testa crustaceous, pitted. Albumen horny or fleshy. Embryo straight; cotyledons flat.—Herbs, with entire or divided foliage. Stipules none. Flowers yellowish, in 1-sided racemose cymes.

A small Natural Order whose members are almost entirely natives of the American hemisphere.

1. WORMSKIOLDIA, Schum. et Thonn.; Benth. et Hook. f. Gen. Plant. i. 807.

Calyx tubular, 5-toothed. Petals 5, obovate, stalked, springing from the tube of the flower. Stamens 5, springing from the extreme base of the flower-tube; filaments thread-like; anthers oblong. Ovary linear-oblong, 1-celled; styles 3, thread-like; stigmas fringed. Capsule linear,

pod-like, bursting loculicidally by three valves, bearing the placentas in the centre. Seeds numerous, ascending, cylindrical, funiculate; arillus membranous, 1-sided; testa crustaceous, striated, pitted. Embryo straight in the axis of fleshy albumen.—Glabrous or hispid herbs with much the aspect of some *Cruciferæ*. Leaves alternate, sessile or stalked, entire or lobed. Stipules none. Flowers yellow or orange, bracteate in racemose cymes.—*Streptopetalum*, Hochst. in Flora, 1841, ii. 665.

A small genus, exclusively African, which has been been placed in various Orders by different authors, being allied to *Frankeniaceæ*, *Droseraceæ*, *Cruciferæ*, *Capparideæ*, &c. By Bentham and Hooker it is referred to the small order *Turneraceæ*.

Pod short, about half an inch long	1. *W. serrata.*
Pod exceeding half an inch in length.	
Common flower-stalk very long and glabrous	2. *W. longepedunculata.*
Common flower-stalk not greatly exceeding the adjacent leaf in length.	
Leaves polymorphous. Petals narrow, linear-spathulate, with very long claws	3. *W. heterophylla.*
Leaves uniform or nearly so. Petals broad at the apex, obcuneate	4. *W. glandulifera.*

1. **W. serrata,** *Hochstetter in Flora*, xxiv. 1841; ii. 666. A branching herb, less than a foot in height, more or less covered with white spreading hairs. Leaves membranous, 2–3 in. long, subsessile, lanceolate, serrate, serratures glandular, rarely pinnatifid. Flowers 3–4, disposed in axillary 1-sided racemose cymes. Common peduncle hispid, shorter than the leaves, rarely bearing a solitary flower. Flower-tube very slender, ½-inch long, 4–5-toothed. Petals obovate, exceeding the sepals, sulphur-coloured or brownish yellow. Pods ½-in. long, oblong, acute, scarcely beaked, 3-valved; valves hispid. Seeds oblong, curved, yellowish, pitted.—*W. abyssinica*, Rich. Fl. Abyss. i. 299; *Streptopetalum serratum*, Hochst. Flora, 1841; ii. 666.

Nile Land. Abyssinia, *Schimper!*
Readily distinguished by its comparatively short pods.

2. **W. longepedunculata,** *Mast.* A branched herb, more or less covered with spreading purplish bristly hairs. Leaves membranous, nearly sessile, linear-lanceolate, tapering at the base, minutely serrate, serratures apiculate. Flowering branches very long, axillary, cylindrical, sulcate, striate, glabrous, bearing near the apex 6–10 flowers in a raceme-like cyme. Bracts ovate-lanceolate, exceeding the pedicels. Calyx tubular, ¾ in. long, covered with white setæ; limb divided into 5 short pointed teeth. Petals much exceeding the sepals, roundish, stalked, bright vermilion-coloured. Pods 3–4 in. long, beaked, 3-valved, valves striated, glabrous. Seeds brownish, pitted.

Mozamb. Distr. Manganya hills, *Dr. Meller!*
The linear leaves and very long glabrous flowering branches give this species a different aspect from its allies.

3. **W. heterophylla,** *Schum. et Thonn. Pl. Guin.* 165. A branched herb about a foot high, covered with short white silky hairs, interspersed

among which are a number of long purple white-tipped spreading bristles, rarely nearly glabrous. Leaves subsessile, membranous, 4–5 in. long, $\frac{3}{4}$ in. broad, lanceolate, tapering at the base, acute at the apex, irregularly glandulose-serrate, entire at the apex, 1-nerved, nearly glabrous, or with a few scattered white hairs, sometimes pinnately lobed. Flower-stalks axillary, slender, glabrous or nearly so, about the length of the adjacent leaf, bearing at the extremity 5 or more flowers in a dense 1-sided racemose cyme. Bracts lanceolate, shorter than the flowers. Flower-buds roundish, ultimately oblong, club-shaped. Calyx $\frac{3}{4}$ in. long; tube cylindrical-clavate, covered with white hairs, limb divided into 5 short triangular teeth. Petals exceeding the calyx, yellow, linear-spathulate with very long narrow stalks attached to the tube of the flower below the middle. Stamens 5, of unequal length; filaments free, ribbon-like, included, attached to the base of the calyx-tube. Pods 2 in. long, slender, cylindrical or beaded, loculicidally 3-valved, valves striated, smooth, bearing the seeds on the centre. Seeds numerous, oblong or flask-shaped, straight or curved, with a white membranous 1-sided arillus at the base; testa crustaceous, pitted, yellow or black.—*W. diversifolia*, Rich. Fl. Seneg. i. 36, t. 11; *Raphanus pilosus*, Willd. Sp. Pl. iii. 562; *Cleome raphanoides*, DC. Prod. i. 240; ? *W. tanacetifolia*, Klotzsch, Pet. Mossamb. Bot. i. 147.

Upper Guinea. Senegal, *Perrottet! Schumacher and Thonning.* Nupe, Niger, *Barter!* Quorra, *Vogel!*

Nile Land. Matamma, *Schweinfurth!*

Mozamb. Distr. Boror, *Peters!*

A species that varies much in stature, texture, and hairiness. Even the colour of the seeds is different in different pods on the same plant. Klotzsch's *W. tanacetifolia*, of which I have not seen specimens, is doubtfully referred to this species.

4. **W. glandulifera,** *Klotzsch in Peters' Mossamb. Bot.* i. 146, t. 26. A branched herb or undershrub, the branches covered with blackish spreading hairs. Leaves membranous, hispid, about 3 in. in length, oblong ovate or lanceolate, tapering at the base into a short stalk, doubly serrate, serratures sharply pointed, apiculate. Flower-stalks axillary, hispid, about the length of the leaves, bearing at the extremity a cluster of flowers. Calyx tubular, dilated in the middle; sepals acute, hispid. Petals obovate, wedge-shaped at the base and tapering into a long narrow claw, hairy at the junction between the claw and the blade. Ovary cylindrical, downy. Capsules cylindrical, pod-like, beaded, 3-valved, valves downy. Seeds oblong, orange-yellow, pitted.

Mozamb. Distr. Between Senna and Lupata, *Dr. Kirk! Peters.*

ORDER LXIII. PASSIFLOREÆ. (By Dr. Maxwell T. Masters.)

Flowers regular, hermaphrodite or unisexual, dichlamydeous or rarely with calyx only. Flower-tube fleshy or membranous, long or short, rarely wanting. Sepals 5, imbricate, distinct, persistent. Petals 5, arising from the flower-tube, generally distinct, sometimes combined into a campanulate corolla, marcescent, rarely wanting. Corona of one

or more rows of threads scales or rings emerging from the flower-tube. Stamens 5 or sometimes ∞, distinct monadelphous or polyadelphous, hypogynous and sessile or raised with the pistil on a stalk or gynophore, or perigynous and springing from the tube of the flower; fertile stamens opposite to the sepals; staminodes (when present) opposite to the petals if in a single series; anthers 2-lobed, basifixed introrse, or dorsifixed versatile, extrorse; dehiscence longitudinal; pollen-cells globose, reticulated. Ovary free, 1-celled, with 3 parietal placentas; ovules numerous, funiculate, anatropal; styles 3, consolidated or separate; stigmas separate (except in *Barteria*), large, capitate, reniform. Fruit baccate, indehiscent or capsular, loculicidally 3-valved. Seeds compressed, with a hard pitted testa, surrounded by a pulpy arillus derived from the expansion of the funicle. Albumen fleshy; embryo large, straight, erect; cotyledons flat, foliaceous; radicle directed towards the hilum.—Herbs undershrubs or trees, the majority (in Africa) of erect habit, elsewhere for the most part climbers. Leaves alternate, stalked, pentastichous, simple or lobed, often with glandular leaf-stalks. Stipules leafy or minute and deciduous. Tendrils axillary, springing from the same axil as the flower-stalks. Inflorescence various but essentially definite. Bracts small, scattered or rather large, foliaceous and involucrate.

A rather large Order (as above defined), the members of which are almost exclusively tropical or subtropical in their distribution, and found in both hemispheres. The majority of the species are American, and belong to one or two genera. The African forms, as will be seen, are included in several genera, but the species are not numerous. The arrangement here adopted is that of the *Genera Plantarum*, but it is questionable whether it would not be a preferable arrangement to exclude from *Passifloreæ* proper the tribes *Modecceæ*, *Acharieæ*, and *Papayaceæ*, and to constitute them into a separate Family intermediate between *Passifloreæ* and *Cucurbitaceæ*. True *Passifloreæ* seem to have closer relations to the *Turneraceæ*, *Samydaceæ*, and even *Violaceæ*, than to *Cucurbitaceæ*.

Tribe 1. **Passifloreæ.**—*Flowers hermaphrodite. Petals distinct or wanting. Corona conspicuous, in one or more rows. Styles consolidated or distinct.*

* Styles distinct.

Stamens springing from the gynophore.
- Stamens 5 . . . . . 1. Paropsia.
- Stamens ∞ . . . . . 2. Smeathmannia.

Stamens springing from the innermost cup-like ring of the corona.
- Petals absent . . . . . 3. Tryphostemma.
- Petals 5 . . . . . 4. Basananthe.

** Styles consolidated. Stigma capitate.
- Stamens ∞ . . . . . 5. Barteria.
- Stamens 5 . . . . . 6. Crossostemma.

Tribe 2. **Modecceæ.**—*Flowers unisexual, rarely hermaphrodite. Petals distinct, usually inconspicuous. Corona inconspicuous or wanting.*

Flowers unisexual.
- Anthers 2-celled.
  - Calyx 5-cleft . . . . . 7. Modecca.
  - Calyx deeply 5-parted . . . . . 8. Ophiocaulon.
- Anthers 1-celled . . . . . 9. Atheranthera.

Flowers hermaphrodite . . . . . 10. Machadoa.

1. **PAROPSIA**, Noronh.; Benth. et Hook. f. Gen. Plant. i. 812.

Flowers dichlamydeous, hermaphrodite. Flower-tube very short, lobes oblong, obtuse, downy. Petals oblong or linear-spathulate, unicostate. Corona laciniate, segments linear, ciliated, arranged in 5 bundles opposite to the petals. Stamens 5, monadelphous, adherent at the base to the gynophore; anthers cordate. Ovary ovoid on a short stalk; styles 3; stigmas capitate; ovules numerous, attached to parietal placentas. Capsule subglobose, 3-valved, valves membranous, downy. Seeds ovoid, compressed, with a long funicle which expands into a cup-shaped membranous arillus; testa crustaceous, pitted. Embryo in the centre of fleshy albumen; cotyledons leafy.—Shrubs more or less covered with rusty down. Leaves coriaceous, oblong. Stipules none. Flowers small, numerous, in dense terminal panicles or solitary.

A genus of four or five species, some natives of Madagascar and the Malayan Archipelago, others of West Tropical Africa.

Flowers in axillary fascicles . . . . . 1. *P. guineensis.*
Flowers solitary . . . . . 2. *P. grewioides.*

1. **P. guineensis,** *Oliv. in Journ. Linn. Soc.* viii. 161. A shrub whose cylindrical branches are densely clothed with rusty tomentum. Leaves on short cylindrical stalks, subcoriaceous, 5–7 in. long, 2–3 in. wide, elliptic, acuminate, repando-dentate, unicostate, arcuate-veined; veins downy on the under surface. Stipules none (or minute and caducous?) Flowers numerous, small, appearing before the leaves, shortly pedicellate, pedicels fasciculate, in the axils of small ovate caducous bracts; tufts arranged in long terminal much-branched panicles. Calyx campanulate, downy; tube very short, limb divided into 5 coriaceous 3-nerved segments. Petals 5, springing from the throat of the calyx, membranous, whitish, pilose externally, twice the length of the sepals. Corona attached to the base of the calyx-tube and consisting of a shallow membranous tube or ring, divided at its upper margin into numerous linear ciliated segments half the length of the petals. Column short, smooth, bearing at its upper portion 5 flat filaments; anthers oblong, 2-celled. Ovary globose, as long as the filaments, glabrous, 1-celled, with 3 parietal placentas opposite to the filiform style; stigmas large, capitate, reniform. Fruit . . . .?

Upper Guinea. Old Calabar, *Rev. W. C. Thomson!*
Differs considerably in habit from the Malayan and Madagascan species, but is nearly identical with them in the conformation of the flowers.

2. **P. grewioides,** *Welwitsch in Herb.* A shrub or small tree, 8–20 ft. in height, with the aspect of a *Grewia*. Branches erect, slender, terete, purplish with reddish down. Leaves 4 in. long, 1½ in. wide, subcoriaceous, dark shining green above, paler beneath, glabrous or slightly pubescent along the nerves, oblong, abruptly acuminate, serrulate, unicostate, arch-veined, tapering at the base into a short glandless stalk. Stipules fugacious, very minute. Peduncles axillary, erect, one-

flowered, about three times the length of the leaf-stalk. Bracts 2 lines long, subulate-lanceolate, deciduous. Flower-buds oblong, obtuse. Flower about $1\frac{1}{2}$ in. in diameter. Sepals imbricate, patulous, subcoriaceous, linear-oblong, acute, covered with rusty tomentum on the outside and with paler down within, thinner and less densely covered with hair on the covered edges. Petals resembling the sepals in form and size. Corona cup-shaped, coriaceous, densely villous outside, half the length of the petals, ultimately dividing into lobes. Stamens opposite to the petals; filaments thin, flattened, subulate, somewhat villous; anthers oblong, acute, sagittate at the base, 2-celled, introrse. Ovary shorter than the stamens, subglobose, densely villous; styles 3, short; stigmas capitate, large. Capsule subsessile, obovate or club-shaped, greenish-yellow, at first hairy, ultimately smooth, exceeding the persistent calyx, bursting by three valves. Seeds obovate, mucronate, compressed. Testa whitish, pitted.

Lower Guinea. Golungo Alto, *Dr. Welwitsch!*

In habit and general appearance this plant is precisely like a *Smeathmannia*. Its floral construction, however, is that of *Paropsia*.

2. **SMEATHMANNIA**, Soland.; Benth. et Hook. f. Gen. Plant. i. 812.

Flowers dichlamydeous, hermaphrodite. Flower-tube very short. Sepals 5, oblong. Petals 5, springing from the edge of the tube. Corona cup-shaped, attached below to the throat of the flower-tube, crenulate and ciliate at the free margin. Stamens about 20, connate below in a narrow membranous ring fringed at the edge; filaments threadlike; anthers introrse, oblong. Ovary shortly stalked or sessile, ovoid; styles 3–5, filiform; stigmas large, capitate; ovules numerous. Capsule coriaceous, ovoid, 3-valved. Seeds obovoid, compressed; testa crustaceous, pitted; arillus small, cup-shaped or none; albumen none; cotyledons leafy.—Shrubs with coriaceous oblong leaves. Petioles glandular. Stipules minute, caducous. Flowers large, white, axillary, solitary or geminate.—*Bulowia*, Schum. et Thonn. Pl. Guin. 246.

A genus confined to Western Tropical Africa.

Ovary villose. Capsule scarcely or not at all exceeding the persistent calyx . . . . . 1. *S. pubescens.*
Ovary glabrous. Capsule considerably longer than the calyx. . . 2. *S. lævigata.*

1. **S. pubescens,** *R. Br.; DC. Prod.* iii. 322. A much-branched shrub. Branches sulcate-striate, puberulous, purplish. Leaves subsessile, coriaceous, 2–3 in. long, subglabrous or pilose on both surfaces, oblong, obtuse, subcordate or rounded, rarely tapering at the base, where they are provided on either side with two prominent stalked glands, dentate, unicostate. Peduncle axillary, simple, less than an inch long, covered with reddish silky hairs. Bracts lanceolate acuminate. Flowers large, white, 2–$2\frac{1}{2}$ in. in diameter when expanded. Sepals quincuncially imbricate, oblong, acute, the exposed portions

covered with golden-brown or rust-coloured silky hairs, the covered edges white, petaloid. Petals membranous, white, obtuse, exceeding the calyx and attached to its throat. Corona annular, crenulate and ciliate at the margin. Column bearing on its upper portion 20 stamens, filaments exceeding the ovary; anthers apiculate. Ovary globose or ovoid, densely hispid at the apex. Capsule not exceeding the persistent calyx. Seeds pitted.—*Büttnovia illustris*, Schum. et Thonn. Pl. Guin. 247. *S. media*, R. Br.; Linn. Trans. xiii. 220.

Upper Guinea. Niger, *Barter! Vogel!* Abbeokuta, *Irving!* Sierra Leone, *Afzelius! Whitfield!* and others. Bagroo river, *Mann!* Cape Coast, *Brass!*

The leaves of this species are variable, as is also the degree of hairiness. The villose ovary seems more constant.

2. **S. lævigata,** *R. Br.; DC. Prod.* iii. 322. An erect branched shrub. Branches slender, terete, smooth or slightly downy, sulcate, striate. Leaves on short stalks, coriaceous, smooth, 2–4 in. long, 1½ in. broad, oblong, tapering at the base, abruptly acuminate at the apex, undulate, serrate, unicostate, arcuate-veined. Petiole very short, thick, with two sessile glands on each side at its base. Peduncle solitary, axillary, simple, 4–5 lines long, covered with brown appressed bristly hairs provided at the base with two or three small coriaceous, concave, oblong, obtuse bracts. Calyx campanulate, deeply five-parted, lobes coriaceous, oblong, quincuncially imbricate in the bud, the exposed portions downy, the covered edges white petaloid. Petals 5, oblong, obtuse, thinner than the sepals, white, many-nerved, longer than the sepals. Corona annular, laciniate and ciliated at the edge. Ovary oblong-ovoid, glabrous; styles 5, persistent, filiform, glabrous; stigmas large, capitate. Fruit ovoid or subglobose, crustaceous, smooth, red, twice as long as the persistent calyx, ultimately 3-valved. Seeds pitted.

Upper Guinea. Sierra Leone, *Afzelius! Barter!* and others. Senegambia, *Heudelot! Perrottet.* Bagroo river, *Mann!*

On comparing numerous specimens of these beautiful shrubs, I find the diagnostic characters laid down by Brown to be inconstant and insufficient, especially in the case of the leaves, which are variable in form. The corona, which Brown says is barbate in *S. pubescens* and beardless in *S. lævigata*, appears to me to be equally ciliated in both species. For these reasons his species *S. media* is here merged in *S. pubescens*, as was indeed suggested by Planchon (note in Herb.).

3. TRYPHOSTEMMA, Harv.; Benth. et Hook. f. Gen. Plant. i. 811.

Flowers hermaphrodite. Flower-tube very short, limb divided into 5 or 6 oblong imbricate divisions. Petals none. Corona attached to the base of the calyx, outer row nearly as long as the sepals, tubular and membranous in its lower half, upper portion of numerous free wavy filaments, inner row membranous, cup-shaped, much smaller than the outer, encircling the base of the ovary and bearing the stamens. Stamens 5, free, attached to the inner corona, as long as the sepals and opposite to them; anthers adnate, 2-lobed, sagittate. Ovary subsessile, glabrous, 1-celled; ovules few or numerous, on 3–4 parietal placentas.

Capsule subsessile, subcoriaceous, oblong, glabrous, loculicidally 3-valved; valves bearing the placentas in the centre. Seeds large, pendulous, included within a membranous aril; testa crustaceous, pitted.—Erect or climbing perennial herbs, with or without tendrils. Leaves simple, alternate, stalked, stipulate. Flower-stalks axillary, simple or tendril-like. Flowers small, greenish.

A small genus, established by Dr. Harvey, on an erect species from Natal, in which the perianth is 5- or 6-parted, and in the latter case the perianth seemingly in 2 rows. In the Zanzibar species discovered by Dr. Kirk, the habit is that of the species of *Modecca*, and the perianth is clearly in one row, though the segments are imbricate.

1. **T. zanzibaricum,** *Mast.* A climbing tendril-bearing plant, with slender smooth angular furrowed branches. Leaves alternate, stalked, membranous, smooth, elliptic or lanceolate, subcordate or rounded at the base, acute at the apex, serrulate, serratures sometimes glandular, unicostate, 3–4 in. long, 1–1½ in. wide. Leaf-stalk slender, one-fourth shorter than the blade, destitute of glands. Stipules linear, subulate, persistent, much shorter than the leaf-stalks. Tendrils axillary, simple, coiled in one direction only, thickened towards the apex, sterile or floriferous. Flowers pedicellate; pedicels very slender, somewhat shorter than the flower, borne on tendrils and provided at the base with 3 stipule-like bracts. Calyx campanulate, 3–4 lines long, smooth, deeply 5-cleft, lobes obtuse, many-nerved. Corona double, attached to the base of the perianth, the outer one shorter than the sepals, upper half fimbriate and lobulate at the edge; lobules triangular, inflexed; inner corona half the length of the outer corona, everted at the edge, and encircled at the base by a thick glandular ring. Filaments ribbon-like; anthers included. Ovary sessile, ovoid; ovules numerous. Styles 3, at the apex of the ovary; stigmas capitate. Capsule an inch in length, yellow, oblong, pointed. Seeds rather large, pitted, oblong, enclosed within a white membranous aril.

Mozamb. Distr. Zanzibar, *Dr. Kirk!*

This species differs from the Natal plant described by Dr. Harvey, mainly in its climbing habit; the 6-parted 2-ranked perianth described by him not being a constant character, many of the flowers being 5-parted, as in the Zanzibar species here described.

4. **BASANANTHE,** Peyr.; Benth. et Hook. f. Gen. Plant. i. 812.

Flowers dichlamydeous, hermaphrodite. Flower-tube very short. Sepals 5, lobes oblong, originally imbricate. Petals 5, perigynous, linear, withering, shorter than the sepals. Corona triseriate, the outermost series springing from the throat of the flower, tubular, membranous below, dividing at the upper edge into two divisions, an outer and an inner, the outer consisting of numerous fine erect or spreading filaments, the inner of small inflexed pointed teeth; the middle row of the corona is either a fleshy ring or a spreading or reflexed membrane; the innermost row is a membranous cup encircling the base of the stamens. Stamens 5, hypogynous, opposite to the sepals; filaments distinct or connate at the extreme base, ligulate, erect; anthers adnate,

erect, linear-oblong, sagittate, 2-celled, dehiscing longitudinally. Gynophore very short, distinct from the filaments. Ovary 1-celled with three parietal placentas, each of which bears about its centre a single ascending or suspended anatropal ovule; funicle geniculate; styles terminal, distinct nearly to the base or more or less consolidated; stigmas capitate. Capsule ellipsoid, 1-celled, 3-valved; valves membranous, bearing a nerve-like placenta in the centre. Seeds 3, or fewer by abortion, oval compressed, enclosed within a pulpy aril; testa crustaceous, pitted; albumen fleshy. Cotyledons flat, thick.—Herbaceous perennials with woody stocks. Leaves alternate, petiolate, stipulate, simple. Peduncles axillary, branched, 1 branch sterile, the other bearing a solitary bell-shaped flower. Bracts 3, linear-subulate, at some little distance from the flower.

A curious genus, consisting so far as at present known, of two species only, and probably not distinct as a genus from *Tryphostemma*.

The corona has been otherwise described by Drs. Hooker and Peyritsch; but it is believed that the account here given is more accurate. It is, however, difficult to make out the real arrangement from dried specimens.

Leaves roundish. Peduncles reflexed . . . . . 1. *B. nummularia.*
Leaves oblong-lanceolate. Peduncles straight . . . . . 2. *B. littoralis.*

1. **B. nummularia,** *Welw. in Trans. Linn. Soc.* xxvii. 28, t. ix. An herbaceous perennial with a thick woody erect stock giving off at the top numerous slender spreading or erect branched divisions, 5–8 in. long. Branches slender, angular, greyish, smooth or sulcate-striate. Leaves about an inch long, conduplicate, reflexed, membranous, glabrous, roundish, cordate, obtuse or divided into two shallow rounded lobes with an intermediate mucro at the apex, serrated on the margin, 1-nerved, feather-veined. Petioles shorter than the blades, channelled on the upper surface, without glands. Stipules linear-subulate, half the length of the petiole. Peduncles axillary, slender, as long as the leaves, dividing into branches, one sterile, the other floriferous, recurved. Bracts 3, linear-awl-shaped, remote from the flower. Flower-tube very short. Calyx-lobes 4–6 lines long, oblong, obtuse, glabrous, many-nerved, greenish outside, whitish within. Petals membranous, whitish, many-nerved. Intermediate row of corona a shallow fleshy ring; filaments ribbon-like. Ovary ovoid, glabrous; styles 3, long, slender. Capsule almost sessile, nodding, ½ in. long, obtuse at both ends, smooth. Seeds 2 lines long, ovoid or reniform, compressed, included within a pulpy aril; testa brown, hard, pitted; albumen fleshy. Cotyledons flat, fleshy.

Lower Guinea. Benguela, Huilla, *Dr. Welwitsch!* Alt. 3800–5500 ft.

A singular little species, having much the aspect of a species of *Viola*, and in the foliage of some *Alchemilla*.

2. **B. littoralis,** *Peyr. in Wawra et Peyr. Sert. Benguel.* 29. An herbaceous perennial with numerous decumbent or erect, much-branched stems. Branches cylindrical or slightly angular, slightly longitudinally sulcate, smooth, purplish, hollow. Leaves alternate, petiolate,

membranous, about an inch long, oblong-lanceolate, 1-nerved, arch-veined, tapering at the base, mucronate at the apex, serrate, serratures mucronate, mucros curved. Petioles 4–6 lines long, terete, channelled on the upper surface and furnished at the margins with numerous stipitate glands. Stipules linear-subulate, nearly as long as the petioles. Peduncles axillary, about twice the length of the leaf-stalks, dividing above into 2–3 bracteate divisions, of which one only bears a flower. Bracts linear-subulate, like the stipules, about 2 lines from the flower. Flower erect, bell-shaped, whitish, 4–6 lines long. Flower-tube very short. Sepals herbaceous, 3–4 times longer than the tube, linear-oblong. Petals membranous, white, many-nerved, rather shorter than the sepals. Intermediate row of corona membranous, spreading or deflexed, about one-fourth of the length of the outer row; third row of the corona rather longer than the second row. Filaments flat, ribbon-shaped, 1-nerved, dilated at the base, attached to the back of the linear anthers by a narrowed extremity. Ovary ellipsoidal, glabrous, raised on a short stipes or subsessile; styles consolidated for three-fourths of their length, dividing above into 3 stigmatic branches. Capsule nodding, $\frac{1}{2}$ in. long, smooth, obtuse at both ends.

Lower Guinea. Benguela, *Peyritsch; Dr. Welwitsch!*

5. **BARTERIA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 812.

Flowers dichlamydeous, hermaphrodite. Flower-tube short, deeply divided into 5 oblong-lanceolate overlapping segments. Petals 5, springing from the edge of the flower-tube. Corona of two rows emerging from the throat of the flower-tube; outer row membranous, jagged at the edge, about half the length of the petals; inner row much smaller, consisting of a ring of thick fleshy tubercles. Stamens numerous, monadelphous at the base, emerging from the base of the flower-tube; filaments in two rows; anthers linear-oblong, introrse. Ovary sessile, globose; styles consolidated; stigma large, mushroom-shaped. Fruit coriaceous, indehiscent, globose. Seeds ovoid, compressed; testa pitted.—Trees or shrubs with large leathery leaves and numerous flowers arranged in dense axillary or supra-axillary tufts, surrounded by overlapping bracts.

A genus comprising two species only, and confined to Western Tropical Africa.

Inflorescence 2–4-flowered. Flowers in loose axillary tufts . . . 1. *B. nigritiana.*
Inflorescence many-flowered. Flowers in dense axillary appressed cymes . . . . . 2. *B. fistulosa.*

1. **B. nigritiana,** *Hook. f. in Journ. Linn. Soc.* v. 15, t. 2. A small tree or shrub with stout branches, covered with rusty down, and marked on either side with a raised line continuous with the base of the leaves. Leaves coriaceous, glabrous, 6–10 in. long, 2–3 in. wide, oblong, subacute, crenulate or entire, unicostate, rounded at the base or tapering into a short thick leaf-stalk. Stipules deciduous. Flowers large, 1–1$\frac{1}{2}$ in. in diameter, sessile or subsessile in axillary tufts, each tuft con-

sisting of 2–4 flowers, each of which is invested by a series of overlapping coriaceous chestnut-coloured acute or cuspidate bracts. Flower-tube very short, glabrous. Sepals 5, somewhat coriaceous, oblong-lanceolate or obtuse, downy and golden brown on the outer side, smooth and whitish within. Petals oblong, wider than the sepals and about equal to them in length, white. Stamens hypogynous or slightly perigynous; filaments slender. Ovary smooth; style simple, as long as the filaments and terminated by a large conical or cushion-shaped stigma. Fruit ovoid, about the size of a pigeon's egg, coriaceous, reddish, 1-celled, with numerous compressed pitted seeds attached to parietal placentas.

Upper Guinea. Nun river, Niger, *Barter!* Gaboon, *Mann!* Bouny river, *Mann!* Old Calabar, *Thomson!*

2. **B. fistulosa,** *Mast.* A small tree with angular, smooth or lenticellate, fistular branches. Leaves leathery, 10–12 in. long, 3–4 in. wide, oblong, obtuse, glabrous, 1-nerved, somewhat narrower at the base which is decurrent along the branch. Stipules 0. Flowers sessile, in linear clusters emerging from the stem between it and the decurrent edges of the leaf, each encircled at the base by numerous overlapping leathery shining chestnut-coloured oblong obtuse or boat-shaped bracts increasing in size from below upwards. Flowers smaller than those of *B. nigritiana*. Sepals and petals downy on the outside, lanceolate, wavy at the margins. Corona and inner organs of the flower as in the last-named species but smaller. Anthers apiculate

Upper Guinea. Fernando Po, *Mann!*

The so-called decurrent leaves would probably be more correctly described as congenitally adnate to the branch for some distance. The manner in which the flowers emerge from between the sides of the base of the leaf and the stem is very curious.

6. **CROSSOSTEMMA,** Planch.; Benth. et Hook. f. Gen. Plant. i. 813.

Flowers dichlamydeous, hermaphrodite. Flower-tube very short, saucer-shaped, bearing at the top 5 ovate calyx-lobes each traversed by a single nerve. Petals 5, springing from the mouth of the flower-tube, of the same form and size as the calyx-lobes but 3–5 nerved. Corona of one row of filaments emerging immediately within the petals. Gynophore short, dilated above into a cup-shaped body which latter bears 5 stamens alternating with an equal number of short triangular acute erect teeth; filaments short, anthers linear oblong. Ovary sessile in the cup of the gynophore, oblong, triquetrous, tapering above into a short style surmounted by a large entire stigma, one-celled with three parietal placentas; ovules numerous in two rows on each placenta. Fruit . . . ?—A climbing tendril-bearing shrub with stalked leaves and axillary flowers.

The above description is taken from that of Planchon.

1. **C. laurifolium,** *Planch. in Hook. Fl. Nigrit.* 365. A climbing shrub, glabrous throughout. Leaves subcoriaceous, slightly glossy,

oblong, entire, shortly acuminate, acute at the base, 3–4 in. long. Petioles glandless or with 2 small glands at the apex. Tendrils axillary. Inflorescence axillary, solitary; common peduncle ½ in. long, bearing a loose few-flowered cyme; pedicels 1-flowered, jointed in the middle. Bracts minute, setaceous or none. Flowers yellow (*Don*), 1½ in. in diameter. Sepals and petals (in the bud) similar in form, broadly ovate, concave, thickly marked with linear spots, the latter coloured, 3–5-veined, the former green, the outermost smallest with a single central vein or rarely with two lateral ones in addition. Fruit . . .

Upper Guinea. Sierra Leone, *Don!*

There is a specimen of this plant in the British Museum, from which Planchon's description above cited was taken.

7. **MODECCA,** Lam.; Benth. et Hook. f. Gen. Plant i. 813.

Flowers regular, unisexual, dichlamydeous. Male fl.: Calyx tubular, bell-shaped, with a five-lobed limb, sepals quincuncially imbricate in the bud, the overlapping edges entire, the covered margins thin, crenulated. Petals 5, linear-spathulate, 1–3-nerved, laciniated, springing from the base of the flower-tube and included within it. Corona forming a shallow membranous jagged ring around the base of the tube at the point of emergence of the petals, sometimes wanting. Stamens 4–5. Staminodes or glands of the disk 5, liguliform, opposite to the fertile filaments, sometimes wanting. Female fl.: Calyx and petals nearly as in the male flower. Corona springing from near the base of the flower-tube, membranous, jagged, adherent to the sides of the claws of the petals and sending also processes inwards to the inner or true staminodes. Outer staminodes, "glands of the disk," 5, short, strap-shaped, capitate more or less concealed within the folds of the corona; inner staminodes 5, opposite to the sepals, awl-shaped, connate at the base. Ovary stipitate, ovoid or triangular, 1-celled with three parietal placentas; ovules stalked, projecting horizontally inwards and arranged in four vertical ranks along each placenta; style simple, short, dividing into three short branches, each terminated by a large fleshy bilobed or reniform coarsely tubercled stigma. Capsule stalked, coriaceous or fleshy, 3-valved or indehiscent with numerous compressed lenticular seeds, each surrounded by a membranous aril; testa hard, pitted; albumen horny. Cotyledons flat, leafy.—Herbs or climbing undershrubs with slender branches provided with tendrils. Leaves alternate, petiolate, entire or palmately-lobed, with 2 sessile glands at the base of the limb on either side. Stipules minute, deciduous. Flower-stalks axillary, terminating in a tendril, the latter thickened at the extremities. Flowers greenish or whitish.—*Clemanthus,* Klotzsch in Peters' Mossamb. Bot. 143. *Kolbia,* P. de Beauv. Fl. Ow. et Ben. ii. 91, t. 120.

A genus of about twenty species, natives of the Tropical regions of Asia, Australia, and Africa. The African species all belong to Wight's section *Blepharanthus*, characterized by the insertion of the petals at the base of the calyx, not at the throat, and

by the presence of a style and stigmatic branches. The exact nature of the corona and of the "glands of the disk" or outer staminodes, is doubtful, and requires an examination of fresh flowers in all stages of their development for its full elucidation.

Leaves deeply palmately divided.
  Leaves glaucous, not glandular, unless at the base.
    Flowers tubular . . . . . 1. *M. senensis.*
    Flowers funnel- or bell-shaped.
      Corona membranous . . . . . 2. *M. Welwitschii.*
      Corona none . . . . . 3. *M. trisecta.*
  Leaves with a gland in each sinus . . . . . 4. *M. abyssinica.*
  Leaves sprinkled over with glands . . . . . 5. *M. Kirkii.*
  Leaves scabrous . . . . . 6. *M. stricta.*
Leaves entire, not cordate . . . . . 7. *M. Mannii.*
Leaves cordate, entire or divided into shallow lobes . . . . . 8. *M. lobata.*

1. **M. senensis,** *Mast.* A climbing shrub with terete or obscurely angular, smooth, sulcate, striated branches. Leaf-stalks shorter than the blades, channelled on the upper surface, twisted, deflexed and having two sessile glands on each side at the apex; leaf-blades deeply palmately lobed, lobes membranous, smooth, glaucous beneath, oblong, obtuse, tapering at the base into a short petiolule, entire or irregularly pinnately lobed, midrib prominent on the under surface; 3–5 in. long, 1–2 in. wide, the central lobe largest. Stipules minute, awl-shaped, caducous. Peduncle axillary, as long as the leaf, bearing a few-flowered cyme in the middle and prolonged into a tendril. Male fl.: Calyx $\frac{3}{4}$ in. long, limb divided into 5 entire linear-oblong divisions. Petals membranous, entire, their long stalks adherent for the greater portion of their length to the inner surface of the calyx-tube, included. Corona of 5 short flat capitate filaments, alternating with the petals. Stamens 5, filaments monadelphous at the base, above free, thread-like; anthers innate, linear-oblong, obtuse, 2-lobed. Rudiment of the pistil minute. Ovary (according to *Klotzsch*) stipitate, oblong, 1-celled; ovules numerous, on 3 parietal placentas; style very short; stigmas 3, large, reniform. Fruit stipitate, stipes encircled with the persistent remnant of the calyx, oblong, obtuse, smooth, 2–3 in. long, 3-valved, valves coriaceous, orange-red, smooth. Seeds compressed, lenticular, pitted, surrounded by a membranous aril. —*Clemanthus senensis*, Klotzsch in Peters' Mossamb. Bot. 143.

Mozamb. Distr. Zambesi, Senna, and elsewhere, *Dr. Kirk!*

Although I have not seen perfect female flowers of this species, I have no doubt that it should be referred to *Modecca*. Klotzsch described the petals as staminodes, and apparently had not seen the fruits. In the short style it approximates to the Indian species of the section *Microblepharis*. The staminal tube is likewise longer than in the other African species. Dr. Kirk describes the petioles as exceeding in thickness the branch that bears them, but this is not apparent in the dried specimens.

2. **M. Welwitschii,** *Mast.* A climbing undershrub with slender, cylindrical, sulcate, flexuose branches. Leaves membranous, glaucous, 3 in. long, $3\frac{1}{2}$ in. wide, palmately 5-lobed, lobes oblong-lanceolate, tapering at the base into a short stalk, 1-nerved, arch-veined, the two lower lobes smallest, directed downwards, the two median ones ascending, the middle or terminal lobe much the largest and often 3-lobulate,

central lobule ovate, acuminate, contracted at the base so as to form a wide sinus. Petioles 1 in. or more in length, cylindrical, channelled on the upper surface, and with two roundish sessile glands at the junction with the lamina. Stipules minute, subulate. Peduncle axillary, as long as or longer than the petiole, dividing at the upper portion into a branched tendril, some of the divisions of which bear flowers. Male fl.: Calyx about 1 in. long, orange-red, funnel-shaped, with a long tube divided above into 5 linear-lanceolate or oblong, many-nerved lobes. Petals 5, membranous, linear-oblong, attached below the middle of the tube, shorter and narrower than the calyx-lobes. Corona a membranous ring fimbriated at the free edge, projecting from the sides of the tube near the base, and sending inwards a connective process to each side of the filaments, thus forming a series of pouches. Stamens 5, springing from the base of the tube, equal to the petals; filaments flattened, dilated at the base where they are connected together into a short membranous tube, and confluent on either side with the processes from the corona; anthers shorter than the filaments, linear, erect, sagittate at the base, obtuse, muticous, 2-celled, dehiscing laterally by two longitudinal chinks. Rudiment of the pistil minute, styliform. Female fl.: Rather smaller than the male. Calyx and petals as in the male, but smaller. Corona a thickened tuberculate rim projecting from the tube below the centre. Filaments subulate, membranous, connected into a tube at the base; anthers none. Ovary . . . . . ? Capsule stipitate (stipes 1 in. or more long, girt by the remains of the flower), oval, 2–2½ in. long, dividing into 3 leathery, smooth, yellowish valves; seeds compressed, ovoid; testa tubercled.

Lower Guinea. Angola district, Pungo Andongo, *Dr. Welwitsch!*

3. **M. trisecta,** *Mast.* A herb with a thick perennial rootstock (*Welwitsch*). Branches elongate, climbing, slender, terete, sulcate-striate. Leaves membranous, 2 in. long, rather less wide, deeply palmately 5-lobed, lobes oblong-lanceolate, tapering at the base, repand-dentate, occasionally slightly lobulate, central lobe longest, petiolulate. Petiole 1½ in. long, terete, with two large sessile glands at the junction with the blade. Tendrils thickened at the extremity. Stipules ½ in. long, subulate; peduncle longer than the leaf-stalk, cymosely divided at the upper end. Male fl.: ½–¾ in. long, campanulate. Calyx 5-lobed; lobes oblong, shorter than the tube. Petals shorter than the calyx-lobes, membranous, oblong, dilated at the base, 3-nerved; corona none. Filaments membranous, connate at the base into a shallow tube; anthers linear-oblong, erect, apiculate, shorter than the filaments. Pistil rudimentary. Female fl.: Fruit shortly stalked, subglobose, the size of a bantam's egg, capsular, 3-valved; valves leathery, smooth, reddish; seeds ovoid, compressed; testa tuberculate.

Lower Guinea. Angola, Pungo Andongo, *Dr. Welwitsch!*

4. **M. abyssinica,** *Hochst. ex Rich. Flor. Abyss.* i. 297. Stem subarborescent, branches elongate, twining, tendril-bearing, glabrous,

glaucous. Leaves alternate, petiolate, subcordate at the base, palmately 5-lobed, lobes unequal, oblong, sub-oval, obtuse, entire or sublobulate, especially the central lobe, sinuses obtuse, glabrous, glaucous, with one large gland at the base of the limb on the upper surface, and a very small one at the base of each sinus; tendrils simple. Male fl.: forming a thick, cylindrical, axillary spike.

Nile Land. Abyssinia, *Schimper.*

Only known from Richard's description above translated. Hochstetter proposed that it should be made the type of a new genus, *Podiotheca.*

5. **M. Kirkii,** *Mast.* A herbaceous climbing plant, with slender, flexuose, angular, furrowed branches. Leaves membranous, covered on both surfaces with reddish, glandular dots, and with sessile glands in the axils of the nerves on the under surface, deeply 5–7-lobed, lobes linear-oblong, obtuse, irregularly pinnately divided, the median lobe largest, the basal lobes directed towards the stem. Petiole 1 in. or more in length, less than half the length of the blade, thickened and decurrent at the base for a short distance along the stem, and provided at its apex with two large glands on the upper surface. Tendrils thickened at the end. Peduncle axillary, slender, terete, longer than the adjoining leaf, bearing at the top a much-branched, many-flowered cyme, the central branch of which ends in a tendril. Male fl.: Flower-buds elliptic. Pedicels slender, longer than the flowers. Calyx funnel-shaped, about $\frac{1}{2}$ in. long; limb 5-parted, segments imbricate, oblong, obtuse, thinner at the edges where overlapped. Petals emerging from below the centre of the calyx-tube, membranous, 3-nerved, crenulate at the edges. Filaments monadelphous; anthers protruding beyond the mouth of the calyx, basifixed, about the same length as the filaments, linear; connective only slightly prolonged. Staminodes or glands of the disk 5, short, liguliform, capitate, enclosed in membranous pouches formed by petaloid processes extending from the edges of the petals to the staminal tube. Pistil rudimentary. Female fl. . . . .?

Mozamb. Distr. Zanzibar, *Dr. Kirk!*

6. **M. stricta,** *Mast.* An erect branching herbaceous plant, 2–4 ft. high, with cylindrical, sulcate-striate, hispidulous, fistular branches. Leaf-stalks 2–3 in. long, terete, sulcate above, with two sessile glands at the apex; leaves cordate at the base, deeply palmately 5-lobed, lobes oblong-spathulate, sinuate denticulate, hispid, nerves prominent on the upper surface. Stipules minute, linear-subulate, deciduous. Tendrils axillary, hispidulous, floriferous in the centre. Flowers. . .? Fruit-stalks axillary, 1–2 in. long, cylindrical, supporting an ovoid scarlet fleshy berry, 2–3 in. long, encircled at the base by the persistent remnants of the calyx. Seeds numerous, compressed, pitted, arillate. Cotyledons flat; radicle directed to the hilum; albumen horny.

Mozamb. Distr. Zambesi, Tette, *Dr. Kirk!* Murchison falls, *Dr. Meller!*

Apparently a distinct species, though the flowers are not known. Though described as erect, it is supported by its tendrils, which cling to the branches of adjacent bushes.

7. **M. Mannii,** *Mast.* A climbing herb or undershrub, with cylindrical striated branches. Leaf-stalks 1 in. long, shorter than the blade, provided with two sessile glands at the apex on each side; leaves thin, glabrous, membranous, ovate-lanceolate, entire, rounded at the base, unicostate, 4–8 in. long. Flower-stalks axillary, simple below, dividing above into a cyme and terminating in a tendril. Male fl.: Calyx tubular or bell-shaped, $\frac{1}{4}$ in. long, limb dividing into 5 shallow ovate lobes, imbricate in æstivation, the free edges entire, the covered margins thinner, membranous, laciniated. Petals half the length of the calyx. Corona membranous, laciniate, forming a shallow ring at the insertion of the petals. Inner corona (glands of disk) of 5 short filiform threads, surrounding the base of the staminal tube. Stamens 5, filaments subulate, monadelphous below; anthers erect, innate, oblong, obtuse, 4-lobed, longer than the filaments. Female fl.: Calyx as in the male flower. Ovary stipitate; stipes encircled by 5 subulate staminodes; style very short, dividing into three filiform stigmatic divisions; stigmas capitate.

Upper Guinea. Ambas Bay, *Mann!*

This species has smaller flowers than the other African species of this genus. I have only seen imperfect female flowers.

8. **M. lobata,** *Jacq. Fragm.* 82, t. 131. A woody climbing plant, 20–40 ft. high, old stems often an inch in diameter, trigonous, tubercled; branches long, slender, herbaceous or somewhat woody, terete, striated, furrowed. Leaf-stalks of variable proportion, furrowed on the upper surface and furnished with a pair of large sessile glands at the apex; leaves membranous, smooth, polymorphous, oblong or roundish, cordate or hastate at the base, entire or more or less deeply 3–7-lobed, lobes obtuse or slightly pointed. Stipules minute, awl-shaped, caducous. Tendrils axillary, floriferous or sterile, simple or branched, thickened at the clasping end. Male-flowered cymes branched, many-flowered from near the centre of the tendril. Pedicels articulate at the apex, as long as or rather longer than the flowers. Calyx bell-shaped, somewhat dilated at the base, green, sweet-scented, $\frac{1}{2}$–$\frac{3}{4}$ in. long, segments of limb shallow, ovate or ovate-lanceolate, the covered edges induplicate, thin, membranous and jagged at the edges, ultimately reflexed. Petals 5, at a distance one from another, somewhat shorter than the calyx, each with a long slender claw terminating in a spathulate 1-nerved laciniated limb. Corona a shallow membranous jagged ring projecting from the calyx-tube at the point of attachment of the petals, and concealing five shallow pits in the base of the calyx-tube. Glands of the disk, or staminodes, 5 springing from the base of the calyx-tube opposite the pits, each flat, thick, capitate, somewhat recurved at the apex, much shorter than the petals. Stamens 5, included or scarcely protruding; filaments awl-shaped, coherent at the base; anthers basifixed, much longer than the filaments, erect, linear-oblong, 4-lobed, sagittate at the base, obtuse or more generally mucronate at the apex, often studded with glandular dots. Female fl.: springing

from near the base of the tendril, of similar form and size but less numerous than the male flowers and with narrower petals. Corona emerging from the base of the calyx-tube at the same point as the petals, membranous and jagged at the edge, and having numerous projecting folds coherent alike with the edges of the claws of the petals and with those of the inner series of staminodes, thus forming 5 pouches concealing the 5 outer staminodes or glands of the disk, which are similar in position and form to those of the male flower, and are frequently recurved at the apex. Inner or true staminodes 5, in the form of antherless filaments alternate with the petals. Fruit capsular, spheroidal or ovoid, the size of a bantam's egg, ultimately splitting into three coriaceous orange-red smooth valves. Seeds numerous, compressed, pitted, surrounded by a membranous aril.—*Modecca diversifolia*, Schum. et Thonn. Pl. Guin. 435. *M. tenuifolia* (*tamnifolia*), Planch. Fl. Nigr. 366.

Upper Guinea. Niger, *Barter!* Annabon, *Burton!* Fernando Po, *Mann.*

Var. *elegans*. Leaves cordate-ovate, anthers with very long points. *Kolbia elegans*, P. de B. Fl. Ow. et Ben. ii. 91. t. 120.

Upper Guinea. Sierra del Crystal, *Mann!* Niger, *Barter!* Prince's Isle, *Mann! Barter!* Old Calabar, *Rev. W. C. Thomson!*

Lower Guinea. Golungo Alto, *Dr. Welwitsch!*

A variable plant, particularly as regards the form of the leaves, the disposition of the flowers, and the muticous or mucronate anthers. The plant is indistinguishable from that figured by Jacquin as *M. lobata*, and said by that botanist to have been introduced into gardens from India. Lindley, however, who, in the Botanical Register, t. 433, figures the male plant of this species, refers to Jacquin's figure as representing the female, and expressly says that his plant was derived from Sierra Leone. There is therefore reason to think that Jacquin's statement as to the Indian origin of the plant was erroneous, the more so as among the Indian species in the herbarium there is none that corresponds to the present one. Palisot de Beauvois' *Kolbia elegans* is in all probability referable to this species, although it is imperfectly described, and the figure is apparently more fanciful than accurate, especially as to the colour of the flowers.

In the Paris herbarium is a specimen of *Modecca* gathered at Zanzibar by Boivin, and having entire glabrous oblong acuminate leaves with two glands at the base, like those of *M. Mannii*, but the flowers in outward shape more nearly resemble those of *M. lobata*.

8. **OPHIOCAULON**, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 813.

Flowers regular, dichlamydeous, unisexual. Calyx deeply 5-parted, lobes oblong, obtuse, marked with dark lines, valvate, entire, or slightly imbricate in the bud, the overlapped edges thinner and slightly fimbriated. Petals narrow, jagged at the edge, inserted into the base of the flower-tube. Corona and glands minute, rudimentary. Stamens all but hypogynous; filaments awl-shaped monadelphous at the base; anthers linear, erect, 4-lobed, much longer than the filaments. Female fl.: Calyx and petals as in the male. Staminodes 5, subulate. Ovary ovoid or somewhat 3-sided, 1-celled, shortly stalked or sessile; style none; stigmas 3, broad, fringed; ovules numerous, attached to 3 parietal placentas. Capsule sessile or nearly so, ovoid, 3-valved, valves coriaceous, smooth or tubercled. Seeds numerous, ovate, compressed.

pitted, surrounded by a fleshy aril. Albumen fleshy; cotyledons orbicular, leafy, flat.—Climbing shrubs with woody stems and slender branches, often containing a gummy juice. Leaves alternate, stalked, smooth, entire or lobed, with a single gland at the apex of the petiole. Tendrils axillary, thickened at the apex. Flowers small, greenish, arranged in stalked axillary cymose panicles. Pedicels cirrhose.

A small genus, separated from *Modecca* by reason of its small flowers, deeply-parted calyx, obscure corona, and sessile stigma.

Leaves rounded, rarely lobed, white beneath and speckled with reddish spots. Petiolar gland solitary	1. *O. cissampeloides.*
Leaves roundish, 3-lobed, paler beneath. Petiolar glands 2 .	2. *O. gummifer.*
Leaves oblong-lanceolate, rarely obscurely lobed	3. *O. cynanchifolius.*

1. **O. cissampeloides,** *Mast.* A climber with terete ash-coloured branches. Leaf-stalk an inch or more in length, with a single gland at the summit; leaves membranous, glabrous, green or marbled on the upper surface, white below and sprinkled with black spots, suborbicular, abrupt or somewhat cordate at the base, obtuse or slightly acute at the apex, rarely obscurely 3-lobed; tendrils axillary, thickened at the end; sterile, or rarely floriferous. Inflorescence many-flowered, terminal or axillary, cymosely panicled, usually distinct from and shorter than the tendrils. Male fl.: Calyx campanulate, a quarter of an inch or more in diameter, deeply divided into 5 ovate-lanceolate entire lobes, marked with linear spots. Petals 5, shorter and narrower than the calyx-lobes, fringed at the edges, attached at the base of the calyx. Filaments very short, subulate; anthers linear, obtuse, 4-lobed. Rudiment of the pistil minute. Female fl.: Staminodes very short. Fruit of the size of a pigeon's egg and upwards, 3-valved, valves obtuse, coriaceous, brownish orange, ultimately somewhat tubercled, surrounded at the base by the persistent calyx.—*Modecca cissampeloides,* Planch. in Fl. Nigrit. 365.

Upper Guinea. Fernando Po, *Vogel! Mann!* Nun river, *Barter!* Gaboon, *Mann!*

Lower Guinea. Angola, Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*

The leaves are somewhat variable, and particularly on non-flowering branches where they are sometimes deeply 3–5-lobed, and the lobes themselves pinnately divided.

2. **O. gummifer,** *Mast.* A woody climbing plant, with green cylindrical striated branches containing a gummy juice. Leaf-stalks long, with a gland on either side at the apex; leaves 1–4 in. long, 1½–5 in. wide, shorter than the stalks, smooth, membranous, paler on the under surface, roundish, abrupt or wedge-shaped at the base, palmately 3-lobed, lobes shallow, blunt, entire, sinuses wide. Tendrils axillary, as long as the leaf-stalks, thickened at the extremity, floriferous in the middle. Male fl.: Calyx ¼ in. long; lobes subcoriaceous, linear, spotted, the covered edges thin, crenulate, the free edges entire. Petals 5, linear-oblong, entire, 1-nerved, spotted, attached to the base of the calyx, half the length of the sepals and narrower. Stamens 5; filaments short, awl-shaped, erect, coherent at the base. Rudiment of the pistil minute. Female fl.: Fruit coriaceous, ovoid, 1–2 in. long, yellowish,

smooth or nearly so.—*Modecca gummifera*, Harv. et Sond. Flor. Cap. ii. 500.

Mozamb. Distr. Tette and Shamo, Zambesia, *Dr. Kirk!* Zanzibar, *Boivin!*
This plant is said to yield a claret-coloured gum.

3. **O. cynanchifolius,** *Mast.* A climber, with slender terete branches. Leaf-stalks 1–2 in. long, glanduliferous at the apex; leaves membranous, glabrous, 2–4 in. long, 1–2 in. wide, oblong, cordate, acuminate, 1-nerved, sinuate, sometimes 3-lobed, lobes pointed. Tendrils axillary, some sterile, others fertile. Flowers numerous, small, in terminal or axillary panicles. Calyx deeply 5-parted, segments narrow, ovate-oblong, linear-spotted, membranous at the edges, valvate in the bud. Petals membranous, oblong, obtuse, jagged at the edges, shorter than the segments of the calyx. Corona of fine hairs, sometimes nearly wanting. Filaments subulate; anthers linear-oblong, obtuse, much longer than the filaments. Rudiment of the pistil minute.—*Modecca cynanchifolia*, Benth. Fl. Nigrit. 366. ? *M. parviflora*, Don, Gen. Syst. iii. 59.

Upper Guinea. Fernando Po, *Vogel!*
Lower Guinea. Angola district, Golungo Alto, *Dr Welwitsch.*
Don's description above cited is not sufficiently complete to enable me to determine his plant with certainty.

9. ATHERANTHERA, Mast. in Trans. Linn. Soc. ined.

(*cum ic. xylog.*)

Flowers dichlamydeous, unisexual. Male fl.: Sepals 5, distinct, originally equal and equidistant, afterwards, owing to the irregularity of two of the petals, two of the sepals are widely separated from each other. Petals 5, quincuncially imbricate, 3 outer ones flat, 2 inner ones larger and concave. Corona none. Stamens 10, monadelphous at the base, 5 fertile opposite to the petals, 5 sterile; filaments flat, twisted; anthers subglobose, 1-celled, attached to the filament on the dorsal surface, originally introrse, but from the curvature of the filament ultimately extrorse, dehiscing longitudinally by a single chink; pollen spherical; connectives of the anthers? prolonged into horn-like processes which meet in the centre of the flower. Pistil rudimentary. Style minute.—A climbing herb, with alternate, stalked, angular leaves. Tendrils axillary. Flowers panicled.

1. **A. paniculata,** *Mast.* A climbing herb with compressed, glabrous, deeply furrowed stems. Leaves membranous or rather fleshy, green on the upper surface, paler beneath, cordate (basal lobes divergent), angular or ovate-rhomboid, acuminate, repand-dentate, 3–5-nerved, arch-veined, 2–4 in. long, 2 in. wide. Petiole shorter than the blade, terete, channelled on the upper surface, eglandulose. Stipules . . . . . ? Tendrils axillary, thickened at the extremity. Male fl.: numerous, greenish, somewhat bell-shaped, arranged in lax branching, leafless, axillary panicles exceeding the leaves in length. Peduncles and pedicels slender, pedicels spreading horizontally, rather longer than the flowers; bractlets minute, awl-shaped. Petals twice

as long as the sepals, two innermost subcoriaceous, yellowish, much exceeding the remaining three, which, save in size, are like the sepals and flat. Rudiment of the pistil a minute, awl-shaped process or style.

Lower Guinea. Mata de Pungo district, Pungo Andongo, Angola, *Dr. Welwitsch!*

A highly curious plant, whose affinity seems to be with *Modecca*, from which it differs in the irregular flowers and one-celled anthers. A fuller knowledge of this plant is much to be desired.

10. **MACHADOA,** Welw.; Benth. et Hook. f. Gen. Plant. i. 814.

Flowers dichlamydeous, hermaphrodite, bell-shaped. Flower-tube short. Calyx 5-lobed, lobes imbricated, thinner and crested at the covered edges. Petals 5, proceeding from the rim of the flower-tube. Stamens 5, connate at the base; filaments membranous, alternating with 5 small awl-shaped staminodes; anthers linear-oblong, erect, 2-lobed, introrse, surmounted by a prolonged awl-shaped connective, and attached to the filament on the dorsal surface near the base. Gynophore shorter than the ovary; ovary 1-celled, with 3 parietal placentas, and surmounted by a short thick style; stigmas capitate, slightly 3-lobed; ovules anatropal. Fruit-stalk projecting beyond the persistent calyx, and bent downwards. Fruit pendulous, baccate, with a coriaceous rind, obovoid, 1-celled, many-seeded. Seeds ovoid, compressed; testa pitted (*Welw.*).—A low-growing herb, with a thick fleshy rootstock, erect slender stem, and subsessile, long, linear, eglandulose leaves. Flowers in short axillary racemose cymes. Peduncles articulated near the summit, with short, awl-shaped bracts.

1. **M. huillensis,** *Welw. in Trans. Linn. Soc.* xxvii. 29, t. 10. Branches erect, terete, furrowed, glabrous, each about a span in height. Leaves 4–6 in. long, 4–5 lines wide, membranous, linear-lanceolate, tapering at the base, mucronate at the tip, 1-nerved, arch-veined. Stipules minute, awl-shaped. Tendrils none. Flowers 8–10 lines long, erect, between funnel- and bell-shaped; tube very short. Calyx-lobes oblong, obtuse, hooded at the apex, subcoriaceous, except at the imbricated margins which are membranous and crested. Petals 5, distinct, membranous, linear-oblong, 3-nerved, much smaller than the sepals. Anthers included, shorter than the filaments. Ovary on a short stalk, oblong-obovoid; style short, stout; stigma 3-lobed. Fruit-stalk elongated, curved downwards, projecting from the persistent calyx. Fruit elliptical, baccate, with a smooth, leathery, yellowish rind, marked at the apex with the scar of the deciduous style.

Lower Guinea. Huilla, alt. 3800–5500 ft., *Dr. Welwitsch!*

In addition to the preceding *Passiflorœ*, certain species of *Passiflora* are now distributed in cultivation or otherwise throughout tropical regions—*e.g.*, *P. quadrangularis*, a species grown for the sake of its fruit, which has an edible pulp. It is readily known by its square winged stem and large ovate acute leaves; *P. fœtida*, or some of its many varieties, all known by the deeply cut and fringed bracts and the fetid odour; *P. suberosa*, especially that form of it known as *P. minima*, distinguished by its corky bark, its 3-lobed leaves, minute bracts, small flowers, and small roundish or egg-shaped purple fruit.

ORDER LXIV. **CUCURBITACEÆ.** (By Dr. Hooker.)

Flowers unisexual. Calyx-tube adnate with the ovary; lobes 5, rarely 3 or 6, imbricate. Petals 5, rarely 3 or 6, free or connate, often confluent with the calyx-tube. Stamens inserted on the calyx-tube, usually 3, one 1-celled, two 2-celled, rarely 2, 3 or 5; filaments 0 or free or connate; anthers extrorse, free or connate, simple or 2–3-fid, cells straight, curved, conduplicate or contorted; connective broad or narrow, sometimes produced beyond the cells. Ovary usually of 3 confluent carpels with 3 (rarely 1, 2, or 5) double placentas that meet in the axis but bear ovules close to the walls of the cavity, rarely 1–3-celled with solitary pendulous or erect ovules; style simple or 2–3-fid at the apex; stigmas as many as placentas, usually large. Ovules horizontal in most genera. Fruit usually a succulent or hard indehiscent many-seeded berry, rarely dehiscing by valves or irregularly bursting. Seeds of various forms, often imbedded in pulp or with a pulpy outer coat; testa coriaceous, or crustaceous; albumen 0. Cotyledons plano-convex sometimes foliaceous.—Usually climbing perennial-rooted herbs. Leaves alternate, simple or compound, exstipulate, tendrils lateral, solitary, simple or 2–∞-fid. Inflorescence various, axillary. Flowers white or yellow, rarely blue or red. Berry usually bitter and nauseous.

A very difficult Order of plants to describe satisfactorily owing to the separation of the sexes, the necessity of examining flowers and fruit, the difficulty of procuring good specimens, and of analyzing dried ones. Africa presents a large proportion of the known genera (34 out of 68); it also contains the most abnormal genera of the Order, as *Telfairia* with its curious seeds, the erect *Heterosicyos*, the singular fruit of *Raphanocarpus*, the dissimilar male and female flowers of *Dimorphochlamys*, the spiny leafless furze-like *Acanthosicyos*, the oblique-flowered *Momordica anigosantha*, and others. The genera are extremely difficult to classify, and the following key is not wholly natural.

The recorded Tropical African plants of this Order which are unknown to me are—*Bryonia convolvuloides*, A. Rich.; *B. jatrophæfolia*, Rich. (possibly a *Citrullus*), and *B. abyssinica*, ? Lam., all included in A. Richard's Flora Abyssinica, i. 289, 290.

The most remarkable species which I have been unable to determine generically are—

1. A noble very stout climbing species, (*Welwitsch*, 818, from Cazengo in Angola). Leaves palmately 7-lobed, 8 in. diameter, slightly pubescent, lobes triangular acuminate. Tendrils stout, much divided. Male buds crowded in the same axil with the female. Female flower on a long stout peduncle. Ovary narrow-cylindric, 2 in. long. Calyx-lobes lanceolate acuminate. Corolla yellow, 3 in. diameter, apparently not deeply lobed. Style columnar, trifid, stigmas broadly reniform. Fruit (immature) cylindric, 3 in. long, probably very large when ripe.

2. A large stout rigid scandent plant, climbing 20 ft. (Cameroons river, *Mann*), closely allied to *Sphærosicyos*, but petioles eglandular. Leaves 5 in. diameter, orbicular-cordate and palmately 7-angled, obscurely crenate, angles broad, rounded or acute, the terminal acuminate, rather coriaceous, olive brown when dry, obscurely puberulous beneath, with the veins excessively reticulated, petioles stout. Tendrils stout, divided. Male raceme long, many-flowered; peduncle 6–10-in. long, stout, pubescent, pedicels stout, often divided. Calyx-tube slender, ⅔ in. long, contracted above the middle, limb obconic with 5 short distant subulate teeth. Corolla 2 in. diameter, yellow; petals obovate-spathulate. Stamens on the mouth of the calyx-tube; filaments stout; anther-cells flexuous round a broad connective.

TRIBE 1. **Cucumerineæ.**—*Stamens* 3, *rarely* 2 *or* 5. *Ovary with* 3, *rarely* 2-5 *placentas. Ovules and seeds horizontal.* (Exception, the ovules are erect or pendulous in *Raphanocarpus*.)

A. Anther-cells flexuous or conduplicate. (Exceptions, anther-cells straight or simply curved in *Telfairia*, *Cucumeropsis*, *Cladosicyos*, *Oreosicyos*, and some species of *Momordica* and *Cucumis*.)

*Corolla-lobes free to the base or nearly so. Filaments usually free.

†Calyx-lobes serrate. Petals cirrhose . . . . . 1. TELFAIRIA.

†Calyx-lobes entire. Petals not cirrhose.

**Calyx-tube of male elongate. Anthers included in the calyx-tube.

††Petals very narrow, with subulate tips.

Stem climbing. Tendrils simple . . . . . 2. TROCHOMERIA.

Stem erect. Tendrils 0 . . . . . 3. HETEROSICYOS.

††Petals broad, rounded at the tip, anther-cells simply conduplicate.

Petioles eglandular . . . . . 4. PEPONIA.

Anther-cells conduplicate and contorted. Petioles 2-glandular 5. ADENOPUS.

Anther-cells simply conduplicate. Petioles 2-glandular . . 6. LAGENARIA.

See 7. *Luffa*, 16. *Cucumis*, and 17. *Oreosicyos*, some of which have long calyx-tubes.

**Calyx-tube of male short, rarely long in *Cucumis*, *Oreosicyos*, and *Luffa*.

Calyx-tube without scales inside. Filaments distinct, and anthers broad, wholly exserted.

Male flowers racemed. Fruit fibrous inside, operculate. Petioles eglandular . . . . . 7. LUFFA.

Male flowers solitary or fascicled. A leafless spiny shrub . 8. ACANTHOSICYOS.

Male flowers solitary or racemed. Fruit globose woody. Petiole 2-glandular . . . . . 9. SPHÆROSICYOS.

Male flowers solitary. Fruit oblong, soft. Seeds flat. Petioles eglandular . . . . . 10. BENINCASA.

Male flower solitary. Seeds pisiform. Petiole eglandular 11. EURYANDRA.

Calyx-tube without scales inside. Anthers sessile, broad, peltately attached to the mouth of the calyx.

Calyx even. Fruit ovoid . . . . . 12. CUCUMEROPSIS.

Calyx grooved. Fruit cylindric-clavate . . . . . 13. CLADOSICYOS.

Calyx-tube of male short, with 2–3 incurved scales inside. Filaments short, anthers more or less exserted.

Stamens 3. Fruit ovoid or long, many-seeded . . . . 14. MOMORDICA.

Stamens 2. Fruit slender, 2-seeded . . . . . 15. RAPHANOCARPUS.

Calyx-tube of male short or rather long, without scales. Filaments short, inserted within the calyx-tube; anthers included or partially exserted.

Connective produced at the apex . . . . . 16. CUCUMIS.

Connective not produced at the apex.

Anthers minute, peltate, linear, cells straight . . . . 17. OREOSICYOS.

Anthers broad, cells flexuous. Pedicels not winged . . 18. CITRULLUS.

Male pedicels broadly winged . . . . . 19. DIMORPHOCHLAMYS.

See also 25. *Bryonopsis*, and 26. *Dactyliandra*.

*Corolla campanulate, lobed to above or about the middle, rarely below it.

Tendrils simple.

Stigmas 3, narrow, 2-fid or 2-partite. Calyx-lobes entire 20. CEPHALANDRA.

Stigma 1, large, 3-lobed . . . . . 21. PHYSEDRA.

Stigmas 3. Calyx-lobes pectinate . . . . . 22. RAPHIDIOCYSTIS.

Tendrils usually divided.

Flowers in short spikes . . . . . 23. STAPHYLOSYCE.

Flowers solitary . . . . . 24. CUCURBITA.

B. Anther-cells straight or simply curved (hippocrepiform or flexuous in *Bryonopsis* and *Dactyliandra*).
*Connective of anther not produced at the apex.
Anther-cells flexuous or hippocrepiform.
Style inserted in an annular disk. Stipuliform bract 0 . 25. BRYONOPSIS.
Annular disk 0. Petioles with a stipuliform bract at the base . . . . . 26. DACTYLIANDRA.
Anther-cells straight or simply curved.
Annular disk 0. Petioles with a stipuliform bract at the base . . . . . 27. CTENOLEPIS.
Style inserted in an annular disk. Stipuliform bract 0 . 28. ZEHNERIA.
*Connective of anther produced at the apex.
Style inserted into an annular disk.
Fruit sessile. Seed pitted . . . . . 29. MUKIA.
Fruit on a slender pedicel. Seeds green . . . . . 30. MELOTHRIA.
Annular disk 0, or very obscure.
Fruit fleshy, indehiscent . . . . . 31. RHYNCHOCARPA.
Fruit dehiscing transversely at the base . . . . . 32. CORALLOCARPUS.

TRIBE 2. **Abobreæ.**—*Stamens* 3, *filaments free; anther-cells flexuous. Ovary* 3–4*-celled; cells with* 1 *or* 2 *ascending ovules.*

33. TRIANOSPERMA.

TRIBE 3. **Sicyoideæ.**—*Stamens* 3–5, *filaments usually connate. Ovary* 1*-celled, with* 1 *pendulous ovule.*

34. SICYOS.

1. **TELFAIRIA**, Hook.; Benth. et Hook. f. Gen. Plant. i. 821

Dicœcious. Male fl.: Racemed. Calyx-tube short; lobes crenate. Corolla rotate, 5-partite; lobes fimbriate. Stamens 3, filaments short, free: anthers dilated, one 2-celled, two 4-celled, cells curved. Female fl.: Solitary. Staminodes 0. Ovary oblong, base tumid and lobed (in *T. pedata*), 3–5-celled, cells imperfectly divided; style short, stigma 3-lobed; ovules many, 1-seriate on the imperfect septa. Fruit elongate, ribbed, 3–5-celled, many-seeded. Seeds large, orbicular, testa fibrous. —A lofty climber. Leaves digitate; leaflets oblong. Tendrils 2-fid. Flowers rather large, pale purple; male pedicels bracteate.—*Ampelosicyos*, Thouars.

Leaves penninerved . . . . . 1. *T. pedata.*
Leaves 3-plinerved from near the base . . . . . 2. *T. occidentalis.*

1. **T. pedata,** *Hook. Bot. Mag.* t. 2751-2; *Bot. Misc.* ii. 154, t. 81, 82. Root stout, fleshy. Stem perennial, 50–100 ft. long. Leaves long-petioled; leaflets 3–5 in., acuminate, repand-toothed, glabrous except the puberulous nerves below, papillose beneath, nerves all uniformly proceeding from the midrib at an angle of 45°. Tendrils lateral, with a pubescent tubercle on the stem opposite their insertion. Male peduncle pubescent; bracteoles 2, serrate. Flowers pale purple, 2 in. diameter. Petals obovate-cuneate, purplish, pubescent at the back, papillose within. Female fl.: About 4 in. diameter. Ovary obtusely 10-ribbed, warted. Fruit fleshy, sometimes 60 lbs. weight, 2–300-seeded. Seed 1 in. broad, cotyledons eatable.—*Feuillæa pedata*, Bot. Mag. t. 2681.

Ampelosicyos scandens, Thouars, Hist. Veg. Ins. Afr. 68, t. 22. *Jolliffia africana*, Bojer ex Del. in Mem. Hist. Nat. Paris, iii. 314, t. 6.

Mozamb. Distr. Bojer ex *Hort. Maurit.* Zanzibar, *Dr. Kirk!*
Seeds oily, boiled and eaten by the negroes.

2. **T. occidentalis,** *Hook. f.* Very similar indeed to *T. pedata*, but the leaflets are all triple-nerved from near the base, the flowers apparently smaller and the calyx-lobes less deeply serrate. Female fl. not seen. Fruit 2 ft. long, acutely 10-ribbed, apex obtusely produced.

Upper Guinea. Sierra Leone, *Barter!* Common in littoral hedges of *Euphorbia aphylla, Dr. Welwitsch!* Fernando Po, *Mann!* Abbeokuta, *Irving!*
Mann states that it is cultivated for the seeds, which the negroes boil and eat.

2. **TROCHOMERIA**, Hook. f.; Benth. et Hook. f. Gen. Plant. ii. 822.

Monœcious. Male fl.: Peduncles 1–3-flowered. Calyx-tube cylindric or funnel-shaped, teeth minute. Corolla rotate, lobes 5, elongate linear or subulate. Filaments 3, free, inserted in the calyx-tube; anthers included, linear, slightly cohering, one 1-celled, two 2-celled, cells conduplicate; connective villous or papillose at the tip. Rudiment of ovary conical. Female fl.: Solitary. Staminodes 3. Ovary oblong; style columnar, stigma 3-lobed; ovules many, on 3 placentas. Fruit ovoid oblong or subglobose, fleshy. Seeds few, tumid; testa smooth, hard.—Scandent or prostrate herbs; root tuberous. Leaves simple, lobed or partite; petiole with or without a stipular bract at the base. Tendrils simple. Flowers yellowish.

Probably a common Tropical and South African genus, of which the southern species are described under *Zehneria* and *Lagenaria* in Harvey and Sonder. Some species have an orbicular pectinate stipular leaf like that of *Ctenolepis*, at the base of some or all of the leaves. The species are most difficult to determine, are excessively variable, and turn black in drying.

Corolla-lobes about $\frac{1}{8}$ in. long.
- Leaves more or less pubescent on both surfaces . . . . . 1. *T. macrocarpa.*
- Leaves nearly glabrous . . . . . 2. *T. vitifolia.*

Corolla-lobes about $1\frac{1}{4}$ in. long . . . . . 3. *T. macroura.*

1. **T. macrocarpa,** *Hook. f.* Pubescent-pilose with rather soft hairs; stem sparingly pilose. Leaves very variable, without white papillæ when dry, pubescent on both surfaces; petioles short. Peduncles 1–3 in. long, very slender, 1–3-flowered; pedicels capillary. Flowers yellow. Calyx-tube $\frac{1}{2}$ in. long, $\frac{1}{8}$ in. diameter. Corolla-lobes subulate, as long as the calyx-tube. Anthers with papillose tips. Fruit fleshy, oblong, $1\frac{1}{2}$–2 in. long, beaked. Seeds ovoid, compressed, nearly $\frac{1}{3}$ in. long, testa very thick.

Form 1. Leaves 1–$1\frac{3}{4}$ in. long, digitately 5–7-lobed to near the base, lobes linear or linear-oblong, sparingly obtusely lobed, peduncles 1-flowered. *Zehneria macrocarpa*, Sond. in Fl. Cap. ii. 488.—The South African form.

? *Form* 2. Leaves reduced to 1 or few very narrow lobes, or altogether wanting; peduncles 2–3-flowered; corolla-lobes narrower.

? *Form* 3. Leaves as in form 1, but lobes lanceolate, sometimes with orbicular pectinate stipular bracts at the base.

? *Form* 4. Leaves broadly reniform-cordate, acuminate, obscurely lobed or angled, irregularly and obtusely toothed, peduncles solitary or in pairs, 1-flowered.

Mozamb. Distr. Form 2. Open country N. of Chiradzura, Lat. 14°–19° S. *Dr. Kirk!*

Lower Guinea. Forms 3 and 4. Angola, Pungo Andongo, dry woods and bushy places, *Dr. Welwitsch!*

2. **T. vitifolia,** *Hook. f.* Stems almost glabrous, climbing amongst grass. Leaves very variable, sometimes reduced or absent, triangular-cordate, acute, with a broad basal sinus, 3–5-lobed or -angled, coarsely unequally toothed, all but glabrous above, minutely pubescent with scattered hairs below, not scabrid, membranous. Stipular bracts broadly ovate-cordate, deeply ciliate-toothed. Male fl.: On capillary 1-flowered peduncles 2–2½ in. long. Calyx-tube ½ in. long, ⅛ in. diameter, cylindric. Corolla-lobes as long as the calyx-tube, subulate-lanceolate. Female fl.: Shortly peduncled, calyx and corolla as in the male. Ovary slightly pubescent.

Lower Guinea. Angola, Golungo Alto, alt. 1000-2400 ft., amongst grasses and shrubs on stony hills, *Dr. Welwitsch!*

Root very large, eaten by the negroes, and used as a medicine. The leaves in the best developed specimens are triangular-cordate, with a large shallow sinus at the base.

3. **T. macroura,** *Hook. f.* Stem glabrous or slightly scabrid. Leaves very variable, oblong-hastate, entire with the basal lobes more or less spreading or digitately 5-lobed to near the base, margins irregularly rather obtusely toothed; lobes linear or lanceolate or oblong, slightly scabrid on both surfaces, upper without white papillæ, lower with minute black papillæ; petioles short. Male fl.: Peduncles very long, capillary, 2–3-flowered, with the capillary pedicels 5–7 in. long. Calyx-tube very slender, funnel-shaped, 1¼ in. long; lobes as long, subulate or almost filiform. Anthers hairy at the tips. Female fl.: not seen.

Upper Guinea. Open country, Nupe on the Niger, *Barter!*

There is another species, apparently of this genus, collected by Baines in South Central Africa, which in its much divided leaves, covered above with large white papillæ, resembles the South African *T. debilis* (*Zehneria*, Sond.), but the fruit is very much larger and oblong, the seeds are as large as those of *T. macrocarpa*, from which its papillose leaves distinguish it.

In Dr. Welwitsch's collections there is perhaps a fourth species, differing from *T. macrocarpa* in being almost glabrous, and having larger and more membranous leaves, 3-lobed to near the base, the middle lobe oblong lanceolate, the latter falcately curved upwards and cut into two broad obliquely obovate obtuse lobules: it may be a form of *T. vitifolia*.

3. HETEROSICYOS, Welwitsch; Benth. et Hook. f. Gen. Plant. i. 822.

Flowers of *Trochomeria*, but erect pubescent herbs, without tendrils.

Probably better regarded as a section of *Trochomeria*, remarkable for its habit and the absence of tendrils.

Leaves polymorphous. Flowers brown-purple . . . . . 1. *H. polymorpha.*
Leaves all 3-partite with linear segments. Flowers straw-yellow . 2. *H. stenoloba.*

1. **H. polymorpha,** *Welw. in Trans. Linn. Soc.* xxvii. 34. Stem erect, 3–6 in., simple or 1–2-branched, flexuose, sulcate, at length glabrescent, from a tuberous turnip-like root. Leaves varying from entire lanceolate to variously ovate lyrate or obcuneate or 3–5-lobed, intermediate lobe longer and broader; petiole 1 line long. Flowers axillary puberulous. Corolla-limb brownish purple; segments patent, $1\frac{1}{2}$–2 lines long, densely papillose within. Berry obovoid or subglobose, smooth, 2–8-seeded.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

2. **H. stenoloba,** *Welw. l.c.* Stem slender, erect, 5–8 in., sparingly branched, flexuose, sulcate, densely pubescent, from a turnip-like root. Leaves 3-partite, segments divaricate, narrowly linear, 2–4 in. long, $\frac{1}{2}$–1 line broad, pubescent. Male fl.: Axillary, nodding, mostly solitary; corolla-limb straw-yellow; segments narrower and more acute than *H. polymorpha.* Female flower and fruit not seen.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*
The above descriptions are taken from Dr. Welwitsch's memoir.

4. **PEPONIA,** Naud.; Benth. et Hook. f. Gen. Plant. i. 823.

Monœcious. Male fl.: Solitary or racemose. Calyx-tube funnel-shaped, globose at the base; lobes 5. Corolla rotate; lobes 5, obovate. Filaments 3, free, inserted within the calyx-tube; anthers cohering, linear, one 1-celled, two 2-celled, cells conduplicate, not transversely waved, connective not produced. Rudiment of ovary glandular. Female fl.: Solitary. Ovary oblong; style columnar, stigma 3-partite; ovules many, on 3 placentas. Fruit ovoid or cylindric, fleshy. Seeds many, obovoid, compressed, black; testa smooth, crustaceous.—Prostrate or climbing African herbs. Leaves entire or lobed, toothed. Tendrils simple or divided. Flowers large, white or yellowish.

Leaves 5-lobed to or near the middle. Calyx-tube 1 in. long .	1. *P. Vogelii.*
Leaves 5–7-lobed to the middle. Calyx-tube $\frac{1}{3}$ in. long . . .	2. *P. Cienkowskii.*
Leaves broadly reniform, obscurely 5-lobed	3. *P. lagenarioides.*

1. **P. Vogelii,** *Hook. f.* Stem slender, laxly villous with spreading flaccid articulate hairs, which clothe more or less the petioles both surfaces of the leaves and inflorescence. Leaves $1\frac{1}{2}$–4 in. broad, membranous, upper surface here and there papillose with minute white dots, orbicular-reniform in outline, deeply cordate with a broad sinus at the base, subpalmately 5-lobed to about the middle; lobes broadly oblong, rather broadest above the base, irregularly shallowly crenate-toothed; petioles $\frac{1}{2}$–$\frac{3}{4}$ in. long. Male peduncles axillary, solitary, $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, 1-flowered. Calyx-tube 1 in. long, contracted above the sphærical base, then subcylindric; lobes subulate, half as long as the tube. Petals pale sulphur-coloured (*Barter*), white (*Vogel*), subacute, 3-nerved, pubescent.

Upper Guinea. Fernando Po, *Vogel!* Lagos, *Barter!*
Barter's specimen is smaller and more delicate than Vogel's; but I see no other dif-

ference except in the colour of the flower. The species is very closely allied to the South African *P. McKennii*, Naud., a much larger plant, with sharply toothed leaves, and a shorter funnel-shaped calyx-tube.

2. **P. Cienkowskii,** *Hook. f.* Sparsely hairy with flaccid articulate hairs. Leaves 3 in. broad, reniform or broadly ovate-cordate, 5–7-lobed, lobes broad, obtusely ciliate-toothed; petioles rather short. Male peduncles shorter than the leaves, stout. Flowers shortly racemose at the apex of the peduncle; pedicels $\frac{1}{6}$ in. long, pilose; bracts oblong-linear, the lower leafy, longer than the pedicels. Calyx-tube $\frac{1}{3}$ in. long, cylindric, slightly dilated below, nearly glabrous, lobes subulate, recurved. Anther-column cylindric, with a very obscure short pencil of hairs at the tip, cells simply conduplicate.—*Adenopus? Cienkowskii*, Schweinf. Rel. Kotschy. 45, t. xxx.

Nile Land. Fesoglu, *Cienkowski.*
Mozamb. Distr. Mozambique, *Dr. Kirk!*
My only specimen is in the same state as Schweinfurth's; that is, with leaves and male buds only.

3. **P. lagenarioides,** *Hook. f.* Stem stout and all parts covered with short lax flaccid hairs. Leaves 4–7 in. broad, herbaceous, young thickly villous, broadly reniform, with a deep broad sinus, obscurely 5-lobed, subdigitately 7–12-veined, lobes very rounded, shortly rather sharply toothed; petioles short, stout, 1 in. long. Tendrils 2-fid. Peduncles 1-flowered. Male 3–4 in. long. Calyx-tube $\frac{1}{3}$ in. long, between funnel- and bell-shaped; lobes lanceolate, recurved, acuminate, half as long as the tube. Corolla-lobes about 1 in. long, yellow-white (*Welw.*). Fruit shortly peduncled, "sub-cylindric, orange-red, $2\frac{1}{2}$–3 in. long, 1–$1\frac{1}{2}$ in. diameter, smooth, smelling of cucumbers. Seeds black, narrow, obovoid, compressed, smooth, rather contracted at the truncate base, not shining nor margined." *Welw.*

Lower Guinea. Huilla region, Angola, bushy places, alt. 5400 ft. on the Morro de Topollo, *Dr. Welwitsch!* A remarkable species, in foliage closely resembling *Lagenaria vulgaris* at first sight, but the leaves are eglandular, and the structure of the flower and fruit is totally different.

There is a third species in the Hookerian herbarium from Zanzibar (*Cucurbita cucullata*, Bojer); it is very near *P. Vogelii*, if not a variety, but the leaves are less lobed, and flowers larger. I have seen an imperfect male specimen only.

5. **ADENOPUS,** Benth.; Benth. et Hook. f. Gen. Plant. i. 823.

Dicœcious. Male fl.: Racemose. Calyx-tube elongate, sub-cylindric, lobes 5, subulate, recurved. Corolla rotate; lobes 5, obovate. Filaments free, inserted within the calyx-tube; anthers 3, included, cohering in a cylindric column, cells flexuous and transversely conduplicate; connective not produced. Rudiment of ovary short. Female fl.: Solitary. Staminodes 0. Calyx-tube not produced beyond the ovary. Ovary subglobose, style short; stigmas 3, broad; ovules many, on 3 placentas. Fruit sphærical or broadly ovoid. Seeds many, obovate, compressed; testa smooth, notched at the apex.—Scandent, scabrous, pubescent-tomentose herbs or shrubs. Leaves 3–5-lobed, sinuate-

toothed, petiole 2-glandular or 2-horned at the apex, rarely eglandular. Tendrils simple or 2-fid. Flowers large, white, fragrant.

Petiole glandular at the apex.	
Leaves glabrous. Calyx-lobes glandular-serrate	1. *A. longiflorus.*
Leaves scabrid. Calyx-lobes eglandular	2. *A. breviflorus.*
Leaves ashy, densely tomentose below	3. *A. abyssinicus.*
Petiole eglandular	4. *A. eglandulosus.*

1. **A. longiflorus,** *Benth. in Fl. Nigrit.* 372. Quite glabrous. Stem slender. Leaves 2–3 in. long, broadly oblong-ovate in outline, longer than broad, 3–5-lobed above the middle, lobes subacute, obscurely toothed, middle longest, truncate at the base, quite glabrous on both surfaces, upper with minute white papillæ when dry; petioles much shorter than the leaf with 2 short spurs at the apex. Tendrils slender. Male peduncle axillary, shorter than the leaf, 3–5-flowered; bracts small, toothed; pedicels short. Calyx-tube $1\frac{3}{4}$ in. long, contracted from below the middle to the globose base, above the contraction cylindric, $\frac{1}{4}$ in. diameter, glabrous, when young pubescent; lobes short, subulate-lanceolate, glandular-toothed. Anther-column $\frac{1}{2}$ in. long, narrow. Female fl. and fruit not seen.

Upper Guinea. Sierra Leone, *Vogel! Don.*

2. **A. breviflorus,** *Benth. l.c.* 373. Stem slender, glabrous or obscurely scabrid. Leaves scabrid on both surfaces, upper covered with minute white papillæ, 3–5 in. long and broad, palmately or pedately 5-lobed to below or above the middle, lobes triangular-oblong, acute with hair points, coarsely distantly toothed; sinus obtuse or acute; base broadly cordate with a shallow sinus; petiole 1–$1\frac{1}{2}$ in. long, with two rounded or spur-like processes at the apex, and often a stipuliform toothed bract at the base opposite the tendril. Male fl.: Racemed at the end of long stout peduncles, 2–3 in. diameter, white, fragrant; bracts 0 or sub-foliaceous; obovate, toothed; pedicels $\frac{1}{2}$–4 in. long. Calyx-tube narrow, funnel-shaped, 1 in. long, slightly swollen at the base; lobes short, subulate, apparently quite entire and eglandular. Corolla-lobes ovate-oblong, clawed. Anther-column elongate. Female fl.: Pedicel stout, 1 in., calyx-lobes subulate. Ovary broadly ovoid, $\frac{2}{3}$ in. long. Fruit globose, smooth, green, with white spots and blotches, hard. Seeds numerous, small, whitish, compressed, ovoid, with thickened borders.—*Lagenaria angolensis,* Naud. in Ann. Sc. Nat. sér. 5, v. 10. *L. mascarena,* Naud. l.c. sér. 4, xviii. 187.

Upper Guinea. Sierra Leone, *T. Vogel!* Borgu, Nigritania, *Barter!* Prince's Island, *Dr. Welwitsch!*

Lower Guinea. Angola and Loanda, in maritime thickets, and in Golungo Alto, alto 1000–2400 ft., *Dr. Welwitsch!*

Mozamb. Distr. Elephant Marsh, Shire river, *Dr. Kirk!*

Dr. Welwitsch's specimens have deeper lobed leaves than those from Upper Guinea. Habit and foliage of *Sphærosicyos Meyeri.*

3. **A. abyssinicus,** *Hook. f.* Stem stout, slightly pubescent. Leaves 4–6 in. broad, nearly orbicular-cordate in outline, 5-angled or

lobed; lobes triangular or broadly oblong, acute, coarsely toothed, green and nearly glabrous above, beneath tomentose with appressed dirty white pubescence, basal sinus open; glands small, depressed. Male peduncles 6–12 in., 3–5-flowered at the apex, stout, nearly glabrous; pedicels short, unequal, pubescent or woolly, bracteoles small or 0. Calyx-tube 1 in. long, $\frac{1}{3}$ in. broad, subclavate, rather ventricose, densely woolly; lobes $\frac{1}{4}$ in., subulate-lanceolate, apparently eglandular. Corolla 3 in. in diameter. Anther-column cylindric, $\frac{3}{4}$ in. long.

Nile Land. Abyssinia, *Schimper*, 1195 (1863–1868)!

4. **A. eglandulosus,** *Hook. f.* Stem and petioles slightly pubescent. Leaves 4–5 in. long, digitately 5–7-lobed to near the base, lobes narrow-lanceolate, acuminate, entire or sinuate-lobed, with scattered hairs on the surface above and on the veins beneath. Male fl.: Peduncle stout, 2–3 in., pilose; pedicels short, pubescent. Calyx-tube $\frac{1}{3}$ in. long, cylindric, slightly dilated in the middle; limb cup-shaped, with 5 remote, very slender, subulate lobes. Corolla 2–3 in. in diameter. Anther-head globose; cells contortuplicate.

Upper Guinea. Sierra Leone!

I have a single poor specimen of this most distinct plant; it was received from Mr. Morson, the eminent pharmacist, by the late R. Brown, and purchased at a sale of some of the plants of the latter gentleman.

The leaves in drying turn very dark brown, as with *A. longiflorus*. I find no trace of glands on the petiole or leaf.

6. **LAGENARIA,** Seringe; Benth. et Hook. f.
Gen. Plant. i. 823.

Monœcious or diœcious. Flowers all solitary; male: Long-petioled. Calyx-tube bell- or funnel-shaped; lobes 5, spreading. Petals 5, free, obovate or obcordate, mucronate. Filaments 3, free, inserted within the calyx-tube; anthers included, cohering; one 1-celled, two 2-celled; cells flexuous, connective not produced. Rudiment of ovary 0. Female fl.: Shortly peduncled. Staminodes 0. Ovary oblong ovoid or cylindric; style short, stout; stigmas 3, 2-lobed; ovules many on 3 placentas. Fruit woody, indehiscent; flesh corky. Seeds many, compressed, margined, furrowed and ridged longitudinally; testa smooth.—A pubescent, musky-scented, annual, climbing herb. Leaves broad; petiole 2-glandular at the apex. Tendrils 2-fid. Flowers large, white.

1. **L. vulgaris,** *Ser.; DC. Prod.* iii. 299. Pubescent, scabrous, tomentose, villous or almost glabrous. Stem stout, climbing. Leaves 1–6 in. broad, orbicular-cordate, undivided angular or more or less 3–7-lobed, toothed. Flowers 2–5 in. diameter, female smaller. Fruit extremely variable in size and shape.—*L. idolatrica,* Ser.? Schimp. Pl. Abyss. No. 1571.

Cultivated throughout tropical and subtropical Africa.

Dr. Welwitsch remarks that in Angola he finds this plant to be constantly diœcious.

7. **LUFFA,** Cav.; Benth. et Hook. f. Gen. Plant. i. 823.

Monœcious or diœcious. Male fl.: Racemose. Calyx-tube bell- or top-shaped; lobes 5, spreading. Petals 5, free, spreading, obovate or obcordate. Filaments 3 or 5, free or connate, inserted on the mouth of the calyx; anthers exserted, free, one 1-celled, two 2-celled; cells flexuous, bordering the broad connective. Rudiment of ovary gland-like. Female fl.: Solitary. Staminodes various. Ovary elongate, angled or grooved; style columnar; stigma 3-lobed; ovules many on 3 parietal placentas. Fruit oblong or cylindric, even or ribbed, dry and fibrous inside, 3-celled, opening by a terminal lid which bears the persistent style. Seeds numerous, oblong, compressed.—Annual, prostrate or scandent herbs. Leaves 5–7-lobed, petiole eglandular. Tendrils simple or 2-multifid. Flowers large, yellow or white; male jointed on to the pedicels. Fruit often large, dry, with a thin epicarp.

Fruit smooth.	
Flowers 1½–3 in. diameter. Fruit not ridged	1. *L. ægyptiaca.*
Flowers 1½–3 in. diameter. Fruit with 3 sharp ridges. . . .	2. *L. acutangula.*
Fruit covered with stout barbed bristles	3. *L. echinata.*

1. **L. ægyptiaca,** *Miller; Ser. in DC. Prod.* iii. 303. Scabrid. Leaves 4–7 in. in diameter, palmately 5–7-angled or lobed, scabrid on both surfaces, distantly irregularly toothed; stipular bract small, cordate, glandular.—Male fl.: Raceme a span long, many-flowered; bracts small, glandular; pedicels very short. Calyx-lobes ½ in. long, triangular-ovate, green. Corolla 1½–3 in. broad. Stamens 3 or 5. Fruit 5–12 in. long, cylindric or trigonous, with 10 dark lines, but no sharp ridges. Seeds black, rarely whitish, with a narrow wing; testa smooth.—*L. pentandra,* Roxb. Fl. Ind. iii. 712. Wight Ic. t. 499. *L. cylindrica,* Rœm.; Naud. in Ann. Sc. Nat. sér. 4, xii. 119 (with synonyms). *L. scabra,* Schum. et Thonn. Pl. Guin. 405.

Upper Guinea. Niger, *Vogel! Barter!*
Nile Land. Kazeh, *Speke and Grant!*
Lower Guinea. Angola, *Dr. Welwitsch!*
Mozamb. Distr. Rovuma river, *Meller!*

Some of the above habitats may refer to the following species, which it is impossible to distinguish in the dry state by flowers and foliage alone. *L. ægyptiaca* is cultivated throughout the tropics, and the young fruit eaten. Naudin says that its native country is uncertain.

2. **L. acutangula,** *Roxb.; Fl. Ind.* iii. 713. Very similar to *L. ægyptiaca,* but according to Naudin the leaves are paler green, more orbicular in outline, and the flowers paler yellow. Fruit 6–12 in. long, oblong-clavate, with 10 sharp ridges. Seeds black, wingless; testa rough.—*L. fœtida,* Cav. Ic. i. 7, t. 9 and 10. Bot. Mag. t. 1638.

Tropical Africa, probably abundant, also abundant in Asia; and cultivated throughout the tropics.

I have taken the character from Naudin, who observes that this is the *Papengaye* of the Negroes; that it presents both bitter and poisonous and edible sweet varieties, and is readily hybridized with *L. ægyptiaca.*

3. **L. echinata,** *Roxb.; Fl. Ind.* iii. 716. Dicœcious. Stem 5-angled, slightly hairy. Leaves 2–4 in. broad, orbicular-reniform, 5–7-lobed to about the middle, basal sinus very broad and open, slightly pubescent and scabrid, lobes broad, obtuse, with shallow teeth or crenatures; petioles rather slender, angled Tendrils 2-fid. Male peduncles longer than the leaves, few-flowered; bracteoles minute; buds downy. Calyx-lobes $\frac{1}{3}$ in. long. Corolla 1 in. in diameter; yellow.—Female fl.: 1–3 together: peduncle short, stout. Ovary ovoid, densely hispid. Fruit $\frac{3}{4}$–1 in. long, ovoid or subglobose, terminated by the stout, woody, columnar style; apex conical, grooved, naked, the rest densely covered with scabrid, spreading, soft, ciliate spines, that harden when dry; interior full of spongy fibrous tissue. Seeds black, numerous, ovoid, compressed, margins rounded, testa granulate, crustaceous.—*Momordica echinocarpa*, Fenzl in Kotschy's Pl. Nub. No. 122.

Nile Land. Nubia, *Kotschy!* Nile, lat. 16°, *N. Grant!* White Nile, *Petherick.*

I find no difference between the Indian and African plants. Roxburgh describes the flowers as white, which they are not in Indian specimens, and does not allude to the spreading cilia on the spines of the fruit; his *L. Bindall* is the same plant with the spines described as ciliate.* The peduncle of the female flower varies much in length.

8. ACANTHOSICYOS, Welw.; Benth. et Hook. f. Gen. Plant. i. 824.

Dicœcious? Male fl.: Solitary or fascicled. Calyx-tube turbinate; lobes 5, short, unequal, very coriaceous with horny tips. Petals 5, very coriaceous, grooved. Filaments short, free, inserted on the mouth of the calyx; anthers exserted, one 1-celled, two 2-celled; cells flexuous, bordering the dilated connective. Rudiment of ovary 0. Female fl.: Not seen. Fruit globose, hard. Seeds many, oblong, tumid; testa thick, hard.—An erect, furze-like, spinous shrub, branched from the base. Leaves seen in young plants only, spathulate, in the angles between the geminate spines. Tendrils 0. Flowers yellow.

1. **A. horrida,** *Welw. in Trans. Linn. Soc.* xxvii. 31. Adult plant 2–3 ft. or occasionally 5 ft. or taller, intricately divaricately branched, deeply sulcate. Leaves squamiform, ovate, crustaceous, scarcely 1 line long, with a pair of straight, subulate, $\frac{1}{2}$ in. spines from each side at the base. Flowering branches 2–5 in. long, suberect, tomentose; flowers subsessile, solitary, or fascicled between geminate spines. Calyx tomentose, lobes usually unequal. Petals subconnate below, broadly ovate, smooth and striate within. Fruit as large or larger than an orange, globose, edible, with a smooth or distantly verrucose rind 1 line thick.

Lower Guinea. Mossamedes, *Dr. Welwitsch.* Also in Namaqualand and the interior from Whalfish Bay, *Anderson, Baines and Chapman.*

Description of species taken from Dr. Welwitsch's Memoir.

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* The third volume of Roxburgh's Flora Indica was posthumously published, and the same plant is repeatedly named and described twice, from the intercalation of mss. of different periods by the editor.

9. **SPHÆROSICYOS,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 824.

Diœcious. Male fl.: Solitary or racemose. Calyx-tube turbinate; lobes glandular. Corolla deeply 5-partite; lobes obovate. Filaments free, inserted on the mouth of the calyx, recurved; anthers exserted, one 1-celled, two 2-celled; cells flexuous, bordering the broad connective. Rudiment of ovary 0. Female fl.: Staminodes small. Ovary oblong; style columnar; stigma large 3-lobed; ovules very numerous on 3 placentas. Fruit globose or nearly so, smooth, epicarp hard, pulp fleshy. Seeds very numerous, obovoid, compressed, smooth, notched, margin thickened.—Prostrate or climbing stout perennials, root fibrous. Leaves lobed; petioles with 2 glands at the apex. Tendrils simple or 2-fid. Flowers large, white. Fruit large.

1. **S. Meyeri,** *Hook. f.* Stem glabrous or nearly so, angled and grooved. Leaves 2–6 in. long, coriaceous, scabrid, 5-lobed to or below the middle; lobes lobulate and sharply irregularly toothed, rarely almost entire, basal sinus open; petiole with 2 conical horn-like processes at the apex. Male peduncles stout, 4–6 in., 2–5-flowered at the apex; bracts minute, or 0. Calyx-tube short, pubescent; lobes small, triangular-subulate. Corolla 3–6 in. diameter; lobes broadly oblong, obtuse. Female fl.: Solitary, shortly pedicelled. Calyx-lobes small. Ovary ovoid, pubescent. Fruit ovoid, green marbled with yellow, quite smooth, hard.—*Luffa sphærica*, Sond. Fl. Cap. ii. 490. *Lagenaria sphærica*, E. Mey. Cat. *L. mascarena*, Naud. in Ann. Sc. Nat. sér. 4, xviii. 187.

Mozamb. Distr. Rovuma river, *Dr. Kirk!*

Also found in Natal, and originally described by Naudin as *Lagenaria mascarena*, from specimens cultivated in the Mauritius.

10. **BENINCASA,** Savi; Benth. et Hook. f. Gen. Plant. i. 824.

Monœcious. Flowers all solitary. Male: Calyx-tube campanulate; lobes 5, leafy, serrate. Corolla rotate, 5-partite; lobes obovate. Filaments free, inserted at the mouth of the calyx, short, flat, thick; anthers exserted, one 1-celled, two 2-celled; cells very flexuous, bordering the thick connective. Rudiment of ovary a glandule. Female fl.: Staminodes 3. Ovary ovoid; style stout, inserted in a disk; stigmas 3, wavy; ovules very numerous on 3 placentas. Fruit an ovoid or cylindric, thick, terete, soft, glaucous, hispid berry. Seeds numerous, ovoid-oblong, flat, margin thickened.—An annual prostrate hairy herb, branches stout. Leaves orbicular-reniform, palmately 5-lobed; petiole eglandular. Tendrils 2–3-fid. Flowers large, yellow. Fruit large, waxy externally.

1. **B. cerifera,** *Savi; Ser. in DC. Prod.* iii. 303. Stems numerous from the root, much branched, hispid or hirsute, several feet long. Leaves softly tomentose, 4–6 in. long and broad, 5–9-angled, toothed,

deeply reniform at the base which is often decurrent on the petiole; stipulary bracts small. Flowers 2½–4 in. diameter. Fruit 1½ ft. long, obtuse at both ends, at first hairy, then naked and thickly clothed with a waxy bloom, flesh white.—Naud. in Ann. Sc. Nat. sér. 4, xii. 87, with synonyms.

Cultivated throughout Asia and the islands for its eatable fruit, also in Africa; but I have seen no African specimens.

11. **EURYANDRA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 825.

Dicœcious. Male fl.: Solitary or fascicled. Calyx-tube funnel-shaped; lobes elongate. Corolla 5-partite; lobes broad, obovate. Filaments 3, inserted at the mouth of the calyx, free, recurved; anthers free, one 1-celled, two 2-celled; cells flexuous, bordering the broad lobed connective. Rudiment of ovary 0 or glandular. Female fl.: Staminodes bearded at the base. Ovary cylindric; style columnar; stigmas 3, cordate, stipitate; ovules very numerous. Fruit a terete spindle-shaped warted berry. Seeds numerous, subglobose; testa coriaceous, smooth.—A lofty slender subtomentose climber. Leaves membranous, palmately 3–5-partite; petiole eglandular. Tendrils undivided. Flowers broad, yellow.

1. **E. formosa,** *Hook. f. l.c.* Stems terete; branches rather slender, slightly hairy. Leaves 4–6 in. broad, pubescent on both surfaces and ciliate with short scattered hairs, digitately nerved, broadly deeply cordate at the base, lobes oblong, obtusely acuminate, quite entire or sinuate-toothed. Male peduncles 2 in. Calyx villous, tube ½ in., subcylindric, expanding suddenly into 5 spreading membranous lanceolate lobes ¾ in. Corolla 3–6 in. diameter; petals obovate. Female fl.: On peduncles ½ in., smaller than the male. Fruit 3 in. long, scarlet when ripe and covered with white warts (*Welw.*). Seeds the size of a pea, testa thickly coriaceous, quite smooth.

Lower Guinea. Angola, district of Golungo Alto, *Dr. Welwitsch!*
The description of female flower and fruit is from Dr. Welwitsch's mss.

12. **CUCUMEROPSIS,** Naud. in Ann. Sc. Nat. sér. 5, v. 30.

Monœcious. Male fl.: Capitate or panicled at the apex of a long peduncle. Calyx-tube campanulate; limb 5-toothed. Corolla 5-lobed. Anthers sessile, peltately attached, glabrous, all 2-celled or one 1-celled and two 2-celled; cells curved surrounding the broad connective. Rudiment of ovary of 3 short columnar filaments. Female fl.: Solitary in the same axil with the male. Staminodes not seen. Ovary shortly ovoid; stigma subsessile, 3-lobed; ovules on 3 placentas. Fruit ovoid, with a hard thin epicarp, smooth. Seeds flattened, ovate, white, like those of a gourd, margin not thickened.—An annual stout climbing scabrous herb, branches terete. Leaves palmately 5–7-lobed and toothed, cordate at the base; tendrils simple. Flowers small, yellow.—*Zehneria* section? *Cucumeropsis,* Benth. et Hook. f. Gen. Plant. i. 830.

1. **C. Mannii,** *Naud. l.c.* Habit of *Cucumis Melo*, but less scabrous, with more terete branches, different inflorescence and stamens and smaller flowers.

Upper Guinea. Cultivated in the Paris Bot. Garden from the Gaboon, *Aubry le Comte*, and Old Calabar, *Mann.*

I know the flowers of this plant only from Naudin's description, and an analysis of the male kindly sent me by MM. Decaisne and Naudin. I have excellent specimens of the foliage from the Paris garden.

13. **CLADOSICYOS,** Hook. f. Gen. Nov.

Flowers monœcious. Male: Subumbellate on a long peduncle. Calyx-tube broadly campanulate, grooved, lobes 5, ovate-subulate. Corolla 5-cleft to the base, lobes oblong, obtuse. Stamens 3, at the mouth of the tube; filaments 0; anthers glabrous, obovate, peltately attached, one 1-celled, two 2-celled, cells curved on the margin of the broad connective. Rudiment of ovary a broad depressed cushion. Female fl.: Solitary in the same axil as the male, on a short stout decurved pedicel. Staminodes minute or 0. Ovary clavate, smooth; style short, stout, without a basal disk; stigmas 3, obcordate sessile; ovules numerous, on 3 placentas. Fruit subclavate-cylindric, tapering into the stout curved pedicel. Seeds not seen.—A large coarse pilose or glabrous scandent much branched herb. Leaves large, entire or palmately 3–5-angled or lobed, petioles stout. Tendrils very stout, undivided. Flowers small, yellow-green. Fruit large, edible.

Genus nearly allied to *Cucumeropsis;* differing in the fruit, the grooved calyx, and in wanting the 3 subulate rudimentary organs at the base of the male flower.

1. **C. edulis,** *Hook. f.* Stem very stout below; branches grooved and angled, the younger especially pilose with soft spreading hairs. Leaves 3–8 in. broad, deeply cordate at the base, sinus rounded, open or closed, membranous and rather succulent, glabrous or minutely pubescent beneath, some scarcely angled, others 3–5-lobed, lobes usually broadly triangular, rarely long, terminal rather the longest, all apiculate and furnished with short distant subulate teeth; petioles stout, 2–4 in. Male peduncles stout, straight, 1–2 in.; pedicels short, curved. Flowers $\frac{1}{3}$–$\frac{1}{2}$ in. diameter. Fruit "1 ft. long, 3 in. diameter," *Welw.*

Upper Guinea. Aboh, *Barter!*

Lower Guinea. Angola, in thickets at the margins of forests in Sobato Mussengue, and near Camilongo, *Dr. Welwitsch!*

14. **MOMORDICA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 825.

Monœcious or dicecious. Male fl.: Solitary or corymbose or racemose. Calyx-tube very short, campanulate, with 2–3 incurved membranous scales inside; lobes rounded ovate or lanceolate. Corolla rotate or campanulate, 5-lobed or -partite, lobes obovate, ribbed, 2 often larger than the others. Filaments 3, rarely 2 or 5, free, short, inserted at the mouth of the calyx-tube; anthers finally free, entire or 2–3-partite or lobed, one 1-celled, two 2-celled; cells flexuous, rarely straight or

simply curved, connective not produced at the apex, which is occasionally villous or papillose. Rudimentary ovary 0 or gland-like. Female fl.: Solitary. Staminodes 0, or 3 glands at the base of the style. Ovary oblong or fusiform; style slender, stigmas 3; ovules very many on 3 placentas. Fruit of various shapes, sometimes 3-valved. Seeds few or many, flat or tumid, smooth or sculptured.—Annual or perennial-rooted, prostrate or climbing herbs. Leaves entire lobed or pedate. Tendrils simple or 2-fid. Flowers large or small, yellow, rarely white.

Leaves compound, 3–7-foliolate.
- Male fl. solitary . . . . . 1. *M. cardiospermoides.*
- Male fl. several on a common peduncle.
  - Fl. subumbellate, concealed by the bract . . . . . 2. *M. cissoides.*
  - Fl. subumbellate, not concealed, regular. Calyx-lobes long-acuminate . . . . . 3. *M. pterocarpa.*
  - Fl. ebracteate, oblique, calyx-tube gibbous . . . . . 4. *M. anigosantha.*
  - Fl. subebracteate. Calyx-lobes rounded . . . . . 5. *M. trifoliolata.*

Leaves simple, entire, lobed or angled.
- Stamens 3.
  - Male fl. solitary, bracteate, bract conspicuous.
    - Bract at apex of peduncle. Calyx-lobes acuminate . 6. *M. Balsamina.*
    - Bract below or near middle of peduncle . . . . . 7. *M. Charantia.*
  - Male fl. solitary, bract 0, or small . . . . . 8. *M. Welwitschii.*
  - Male fl. numerous. Bracts large, cucullate . . . . 9. *M. cucullata.*
  - Male fl. numerous. Bract small or 0.
    - Sepals orbicular, setose or echinate . . . . . 10. *M. Morkorra.*
    - Sepals orbicular, pubescent . . . . . 11. *M. Mannii.*
    - Sepals ovate, mucronate, pilose. Leaves 3-lobed . . 12. *M. corymbifera.*
    - Sepals ovate, acuminate, pilose. Leaves entire . . 13. *M. multiflora.*
- Stamens 2; one anther 2-cleft, the other 3-cleft . . . . 14. *M. Cymbalaria.*

1. **M. cardiospermoides,** *Klotzsch in Peters' Mossamb. Bot.* 150. Glabrous. Stem slender. Leaves 2-ternately compound, secondary petioles slender, tertiary short; leaflets $1\frac{1}{2}$–$2\frac{1}{2}$ in. long, oblong or ovate, simple or lobed, repand-toothed, teeth often ending in hair points, sometimes slightly hairy on the veins above; stipules small, fimbriate; tendrils simple or 2-fid. Male fl.: Solitary; peduncles 3–4 in. long; bract towards the apex, orbicular, concave, leafy, quite entire, ciliolate, $\frac{1}{2}$–1 in. in diameter. Calyx-lobes ovate, obtuse. Corolla 2 in. in diameter, yellow, with a purple eye. Anther-cells flexuous, connective oblong. Female peduncle 1–2 in., ebracteate. Stigma large, 3-lobed. Ovary fusiform. Fruit ovoid-oblong, acute, $3\frac{1}{2}$ in. long, fleshy, subterete, orange-red. Seeds many, ovate, flattened; testa dark-brown, crustaceous, with a few large tubercles.

Mozamb. Distr. *Dr. Peters.* Senna, Shupanga and above Pita Island, *Dr. Kirk!* (with good drawings of male fl. and fruit).

2. **M. cissoides** (*M. guttata* and *M. maculata*), *Planch. in Niger Flora,* 370–1. Dioecious, almost glabrous, except the young shoots and leaves and inflorescence which are pubescent. Stem slender, extensively climbing. Leaves 3-foliolate, with the lateral lobes 2-partite or again 2-foliolate, leaflets on short petioles, middle one

largest, 3–5 in. long, all membranous, ovate-lanceolate, acute at both ends, coarsely sinuate-toothed, teeth aristate, minutely papillose on both surfaces when dry, puberulous above; stipular bract 0?; tendrils simple. Male fl.: Crowded in the axil of the large (1–2 in. in diameter) orbicular, sessile, toothed bract, shortly pedicelled, densely pubescent. Calyx-teeth ovate-lanceolate, $\frac{1}{2}$ in. long, apex slender, acuminate. Corolla $\frac{3}{4}$–1 in. in diameter, white, with black eye. Female fl.: Solitary; peduncle $2\frac{1}{2}$ in.; bract as in the male. Ovary ovoid, covered with soft puberulous spines. Fruit similar to *M. balsamina* (*Barter*), ovoid, narrowed at both ends, densely covered with spreading pubescent spines. Seeds numerous, turgid, testa crustaceous, uneven.

Upper Guinea. Sierra Leone, *Don.* Fernando Po, *Vogel! Barter! Mann!* Niger and Quorra, *Vogel! Barter!*

Lower Guinea. Angola, Golungo Alto, in thickets, *Dr. Welwitsch!*

3. **M. pterocarpa,** *Hochst.; Naud. in Ann. Sc. Nat. sér.* 5, v. 24. Monœcious? Pubescent with spreading hairs. Root a large oblong tuber. Stem slender. Leaves digitately 5-foliolate, green when dry, leaflets ovate-lanceolate, acuminate, obliquely cordate at the base, faintly toothed or quite entire, 2–4 in. long, the central largest and sometimes lobed at the base. Tendrils simple or bifid. Male fl.: Crowded in a short incurved raceme at the end of a peduncle 2–5 in., and subtended by an obovate hooded green entire bract $\frac{1}{2}$–$\frac{3}{4}$ in. long; pedicels as long as the calyx. Calyx $\frac{1}{5}$–$\frac{1}{4}$ in. long; lobes ovate, acuminate with long points, pilose. Corolla about 1 in. diameter, yellow, anther-cells nearly straight. Female fl.: Solitary, ebracteate; peduncle $\frac{3}{4}$ in. Ovary slender, 1 in. long, fusiform, tubercled, ending in a long beak. Calyx-lobes longer and narrower than in the male. Fruit 2–3 in. long, ovoid with a long point, with 8–10 short wings, red. Seed nearly orbicular, pale; testa rugose, thick.

Nile Land. Adowa in Abyssinia, *Schimper! Petit!* Cultivated in Hort., Paris.

4. **M. anigosantha,** *Hook. f. n. sp.* Diœcious. Very sparingly hairy. Stem very slender, leaves digitately 5-foliolate; leaflets membranous, broadly or narrowly ovate-oblong, acute, obtusely serrate-toothed, the teeth apiculate, obliquely truncate or subcordate at the base, minutely papillose when dry. Tendrils very slender, 2-fid. Male fl.: Numerous, irregularly subpaniculate or racemed on very slender ebracteate pedicels 1–2 in.; pedicels long and slender the lowest sometimes minutely bracteolate at the base. Calyx-tube broadly campanulate, oblique, deflexed, gibbous at the base; lobes ovate-subulate, spreading, tips filiform, the lower large. Corolla obliquely rotate, yellow, 1½ in. diameter, lobes acuminate. Anther-cells nearly straight, connective narrow; a small hairy staminode placed between the two (2-celled?) anthers. Female fl.: Peduncle short with a minute bract towards the base. Ovary fusiform, muricate, beaked. Fruit (from Kirk's drawing) ovoid, beaked, 2 in. long, covered with large triangular compressed prominences, glaucous-green.

Mozamb. Distr. Shamo on the Shire, *Dr. Kirk!* with excellent analysis.
The horizontal buds, gibbous calyx-tube and oblique flowers are perhaps unique in the Order.

5. **M. trifoliolata,** *Hook. f. n. sp.* Glabrous. Stem angular and grooved, slender, wiry. Leaves very shortly petioled, 3-foliolate; leaflets petioled, 1 in. long, ovate, obtuse, apiculate, rarely lobed, rounded or cordate at the base, obscurely distantly serrate, rather coriaceous, minutely granulate on both surfaces when dry; petioles $\frac{1}{4}$ in. Tendrils simple. Male fl.: Irregularly racemose; peduncles as long as or longer than the leaves; pedicels very variable, spreading, with subulate bracts at their bases and an orbicular small bracteole at the apex appressed to each flower. Calyx-tube hemispheric, lobes suborbicular, obtuse. Corolla 1 in. in diameter, yellow. Anther-cells flexuous. Female fl.: unknown.—*Momordica sp.*, Thomson in Speke and Grant's Travels, Appendix p. 635.

Mozamb. Distr. Zungomero, lat. 7° 27′ S., *Grant!*

6. **M. Balsamina,** *Linn.*; *Ser. in DC. Prod.* iii. 311. Monœcious; glabrous or young parts slightly pubescent. Stem very slender. Leaves membranous, $1\frac{1}{2}$–$3\frac{1}{2}$ in. in diameter, orbicular, palmately 3–5-lobed to about the middle, lobes rhomboid, deeply acutely lobulate; basal sinus deep and broad. Tendrils simple. Male fl.: Peduncle longer than the leaf, bract towards its apex, 1-flowered, green, orbicular-cordate or reniform, almost entire. Calyx-lobes thin, ovate, acuminate. Corolla irregular, yellow or white, centre black, $\frac{1}{2}$–1 in. in diameter. Anther-cells flexuous; connective broad. Female fl.: Peduncle $\frac{1}{3}$ in. long; bract 0 or basal. Calyx-lobes narrower. Ovary fusiform, beaked, warted. Fruit broadly ovoid, narrowed into the peduncle, beaked, smooth, red, fleshy, 1–3 in. long; seeds many, pale brown, $\frac{1}{3}$ in. long, broadly oblong, flattened; edges broad, tubercular, grooved, teeth crustaceous.—A. Rich. Fl. Abyss. i. 291; Naud. in Ann. Sc. Nat. sér. 5, v. 21.

Upper Guinea. (Cape de Verd, *Brunner!* Hence probably all Senegambia.)
Nile Land. Nubia, *Kotschy! Schweinfurth!* Abyssinia, *Petit.*
An abundant Asiatic and South African plant, found also in Australia, and in cultivation in America.
The closely allied Natal *M. involucrata*, which has broad obtuse calyx-lobes, has not been collected hitherto in Tropical Africa.

7. **M. Charantia,** *Linn.*; *Naud. in Ann. Soc. Nat. sér.* 4, xii. 131. Monœcious; glabrous or pubescent-pilose. Stem very slender. Leaves 1–4 in. in diameter, membranous, reniform-orbicular, pedately 5–7-lobed to near the base, basal sinus broad, lobes oblong lanceolate or rhomboid, often much contracted at the base, obtusely sinuate or lobulate. Tendrils simple. Male peduncle 1–5 in., very slender; bract about the middle, reniform or orbicular-cordate, green, quite entire. Calyx-lobes ovate, acute. Corolla irregular, $\frac{1}{2}$–$1\frac{1}{2}$ in. in diameter, yellow. Anthers flexuous, connective narrow. Female peduncle slender, 1–6 in., bracteate towards the base. Ovary fusiform, rostrate,

muricate. Fruit 1–3 in. long, ovoid and rostrate at both ends with many tuberculate ridges, the tubercles triangular. Seeds few, much as in *M. Balsamina*, but more sculptured and white.—Wight Ic. t. 504. *M. Senegalensis*, Lamk.; DC. Prod. iii. 311. *M. anthelmintica*, Schum. et Thonn. Pl. Guin. 423.

Upper Guinea. Gambia, *Boteler!* Nupe, *Barter!* Fernando Po, *Mann!*
North Central. *Vogel!*
Lower Guinea. Angola and Loanda, *Dr. Welwitsch!*
Mozamb. Distr. *Admiral Grey!* Shire valley, *Dr. Kirk!*
Commonly cultivated in India. A very variable plant in all its characters.

8. **M. Welwitschii,** *Hook. f. n. sp.* Monœcious; glabrous or obscurely pubescent, especially on the youngest parts. Stem slender. Leaves membranous, $1\frac{1}{2}$–2 in. in diameter, orbicular-reniform, 5–9-lobed to about the middle, basal-sinus broad, lobes oblong, sharply lobulate or toothed. Tendrils simple or 2-fid. Male peduncles slender, as long as the leaf; bract minute, about the middle. Calyx-lobes $\frac{1}{4}$–$\frac{1}{3}$ in. long, ovate-orbicular, black when dry. Corolla $1\frac{1}{4}$ in. in diameter, yellow; lobes broad. Anther-cells flexuous, connective broad. Female fl.: unknown. Fruit ovoid, smooth or slightly warted, 1–2 in. long.

Lower Guinea. Angola, sandy bushy places, Mossamedes, *Dr. Welwitsch!*
This naturally belongs to the many-flowered section.

9. **M. cucullata,** *Hook. f.* Glabrous, except the shoots. Stem rather stout, mottled green and yellow. Leaves large, 3–5 in. in diameter, broadly ovate-cordate, basal-sinus deep and broad, lobes rounded, margin decurrent on the petiole, sinuate-toothed, bright green; tendrils stout, 2-fid. Male fl.: Peduncles very long, 3–6 in., stout, erect, 3–5-flowered; bract at the base transversely oblong, $1\frac{1}{2}$–2 in. broad, more or less 2-lobed, the lobes arching over the flower-buds, green, membranous, quite entire; flower-buds nodding; pedicels short, glabrous or pubescent. Calyx-tube very short, lobes $\frac{1}{6}$–$\frac{1}{4}$ in. long, broad, rounded, blackish, more or less covered with soft bristles; scales inside large. Corolla yellow, $1\frac{1}{2}$ in. in diameter; lobes obtuse. Anther-cells flexuous; connective broad. Female fl.: Solitary or 2 together, on short stout 1-flowered peduncles; bract above the middle, oblong, petioled. Calyx-lobes as in the male. Ovary ovoid, densely covered with soft spreading bristles.

Nile Land. Abyssinia, *Schimper!*
Lower Guinea. Angola, mountain thickets of Golungo Alto, *Dr. Welwitsch!*
The great hooded bracts of the male fl. on the long stout peduncles at once distinguish this species.

10. **M. Morkorra,** *A. Rich. Fl. Abyss.* i. 292, t. 53. Monœcious. Glabrous or pubescent. Stem rather stout, mottled green and yellow. Leaves bright green, broadly ovate-cordate, 3–5 in. long, acute, coarsely shallowly toothed, basal sinus broad, margin slightly decurrent on the petiole, whole surface or nerves beneath always more or less pubescent.

Tendrils simple or 2-fid, stout. Male peduncles long, stout, subcorymbosely 4–8-flowered; bract 0 or small at the axil of the lowest flower; pedicels very irregular, long or short; buds globose. Calyx-tube very short; lobes orbicular, blackish green, more or less softly setose at the back, margins broadly membranous. Corolla 1½–2 in. broad, yellow. Anther-cells flexuous; connective broad. Female fl.: Peduncle shorter than the male, 1-flowered and ebracteate or with a small accessory flower and bract at the axil. Calyx as in the male. Ovary ovoid, densely clothed with soft spreading bristles. Fruit ovoid, red, fleshy, densely setose, 1–2 in. long, shortly beaked. Seeds few, ½ in. long, oblong, flattened, margins thickened, with 2 grooves and a central ridge, testa thick, rugose.—*M. cordifolia*, Sond. Fl. Cap. ii. 492. *M. Vogelii*, Planch. in Fl. Nigrit. 369. *M. Schimperiana*, Naud. in Ann. Sc. Nat. sér. 5, v. 23. *M.? fœtida*, Schum. et Thonn. Pl. Guin. 426.

Upper Guinea. Fernando Po, *Vogel! Mann!* Ambas bay, *Mann!*
Nile Land. Abyssinia, *Petit!* Fesoglu, *Kotschy.* White Nile, *Petherick!* Gallabat, *Schweinfurth!* Ukidi forest, *Grant!*
Mozamb. Distr. Zambesi, *Dr. Kirk!* Zungomero, *Grant!*

M. Morkorra was originally described from abnormal prostrate, excessively branched and sparingly leafy specimens, from the dry region of Fesoglu. Naudin distinguishes *M. cordifolia* and *Schimperiana* as different species, referring the latter doubtfully to *Vogelii*; but our extensive suite of specimens invalidate all the distinctive characters of these forms.

11. **M. Mannii,** *Hook. f.* Monœcious. Stem slender, mottled green and yellow, glabrous. Leaves 1½–3 in. long, ovate-cordate, long, acuminate, sharply toothed, entire, pubescent on both surfaces, basal-sinus deep and broad. Tendrils slender, simple or 2-fid. Male fl.: Peduncles slender, shorter than the leaf, irregularly 3–6-flowered towards the apex; bract 0, or small, ovate, at the base of the lower pedicel; pedicels pubescent, short or long; buds globose. Calyx-tube very short, lobes black-green, orbicular, rounded at the apex, puberulous; margins broadly membranous. Corolla 1 in. in diameter, yellow. Anther-cells sinuous; connective broad. Female fl.: Peduncle stout, 2–3 in. long, ebracteate. Fruit unripe, 1 in. long, narrow ovoid, beaked, densely covered with long spreading soft spines.

Upper Guinea. Fernando Po, *Mann!*
Allied closely to *M. Morkorra*, but smaller leaves very pubescent, flowers much smaller, and sepals not setose.

12. **M. corymbifera,** *Hook. f.* Monœcious. Stem slender, covered with lax spreading hairs. Leaves 2 in. long, broadly ovate-cordate, long-acuminate, shortly 3-lobed, lobes acute, slightly toothed, densely pubescent on both surfaces; basal-sinus broad, open; petiole pubescent. Tendrils slender, simple or 2-fid. Male fl.: Peduncle slender, shorter than the leaves, subumbellately or corymbosely 6–8-flowered at the apex; bract 0, or small, at the base of the umbel; pedicels short, slender, pilose. Calyx-tube very short; lobes ⅙–¼ in. long, ovate, acuminate or mucronate, pilose; margins scarcely membranous. Co-

rolla $\frac{2}{3}$ in. in diameter, yellow; petals unequal, 2 much larger and very concave. Anther-cells sinuous; connective 2-fid in the 2-celled anthers, narrow, glandular at the apex.

Mozamb. Distr. Near Lupata, *Dr. Kirk!* with good analysis.

Differs from *M. Mannii* in pilose stems, which are not mottled, 3-lobed leaves, acuminate or apiculate hairy sepals, and in the anther-cells.

13. **M. multiflora,** *Hook. f.* Monœcious: very pubescent. Stem slender. Leaves membranous, broadly ovate-cordate, $2\frac{1}{2}$–6 in. long, acuminate, entire, faintly sinuate-toothed, the teeth apiculate, basal sinus rather deep. Tendrils simple or 2-fid. Male fl.: Peduncles solitary or geminate, slender, branched, subcymosely many-flowered; inflorescence densely pubescent and hairy; bracts 0 or small at the forks; buds very small with recurved calyx-lobes, shortly pedicelled. Calyx-tube small, lobes short, ovate, acute. Corolla $\frac{3}{4}$ in. in diameter, yellow. Anther-cells curved, opening inwards, connective rather narrow, 2-fid at the apex. Immature fruit shortly thickly peduncled, subcylindric, smooth, thick, crowned with the persistent floral envelopes.

Upper Guinea. Fernando Po, *Vogel!* Gaboon river, *Mann!*
Lower Guinea. Angola, in damp woods, Golungo Alto, *Dr. Welwitsch!*

A very peculiar species, from the smallness of the buds, and nearly straight, apparently introrse anther-cells.

14. **M. Cymbalaria,** *Fenzl, Pl. Kotschy.* No. 147. Monœcious. Root woody, tuberous with stout fibres. Stem slender, scandent, sparingly branched. Leaves glabrous or pilose, orbicular-reniform, 1–2 in. broad, rather fleshy, obtusely 5–7-lobed, when dry with raised points on both surfaces, but not scabrid; lobes very short, acute or obtuse; petioles variable. Tendrils undivided. Male fl.: Peduncles $\frac{1}{2}$–1 in., slender, hairy, ebracteate, racemose at the apex; pedicels short, spreading. Calyx-lobes lanceolate. Corolla $\frac{1}{2}$ in. in diameter, yellow. Filaments 2, short, stout, flattened, one 2-partite, the other 3-partite, anther-cells flexuous surrounding the divisions of the broad connective. Ovary fusiform, beaked; style rather stout, stigmas 3, spreading, subconical. Fruit 1 in. long, pyriform or broadly fusiform, narrowed into the short stout curved peduncle, fleshy, 8-ribbed, greenish. Seeds very few, almost globose, strophiolate, $\frac{1}{6}$ in. long, testa polished, crustaceous, dark brown.—*Luffa tuberosa,* Roxb. Fl. Ind. iii. 717.

Nile Land. Kordofan and Sennaar, *Kotschy.*
? Mozamb. Distr. *Dr. Kirk!*

A Peninsular Indian plant, of which Wight states the fruit to be eatable. Roxburgh describes the flower as white, and the internal structure of the fruit as fibrous, "like that of *echinata*, but the flowers appear to be yellow, and the fruit, both in Indian and African specimens is wholly destitute of internal fibres." These errors are no doubt due to the editing of the 3rd (posthumous) volume of Roxburgh's work.

15. RAPHANOCARPUS, Hook. f. in Ic. Pl., Tab. 1084.

Flowers monœcious. Male fl.: 2–3 at the apex of the petiole, or the base of the leaf-blade. Calyx-tube small, with 3 incurved scales at

the base inside; lobes ovate or lanceolate. Petals free, spreading, obovate. Filaments 3–4, free, short; anthers one 1-celled, two 2-celled with often 1 or 2 abortive anthers interposed; cells flexuous; connective broad or narrow, not produced at the apex. Rudiment of ovary 0. Female fl.: Peduncle 1–2-flowered, axillary at the base of the petiole, or rarely from the same point as the male. Calyx-lobes smaller and narrower than in the male, and corolla smaller. Ovary slender, fusiform, grooved, 1-celled, cell very narrow; style short, stigma of 2 small rounded flattened lobes; ovules 2, remote, upper erect, lower pendulous. Fruit small, slender, narrow, fusiform, terete, corky, grooved, pilose, 1-celled or with 2 superimposed cells, cells 1-seeded. Seeds linear-oblong, compressed, lower erect, upper pendulous; testa membranous, hyaline.—Prostrate or climbing annual herbs. Leaves ovate or orbicular-cordate. Tendrils simple. Flowers deep yellow. Fruit like a *Raphanus* pod.

A most remarkable genus, on account of the connate peduncle and petiole of the male flower, the structure of the fruit, and the erect or pendulous ovules and seeds. It is chiefly allied to *Momordica* in floral structure, habit, and all other characters.

1. **R. Kirkii,** *Hook. f. in Ic. Pl.* 1084. Stem slender, pilose. Leaves membranous, orbicular-cordate, 2–3 in. long, obtusely angled or 3–5-lobed, lobes acute, quite entire or obscurely toothed; basal sinus broad or narrow. Male fl.: Peduncles very short, slender, 2-flowered, hairy; bract oblong, hairy at the fork; pedicels slender. Calyx-lobes ovate-lanceolate, $\frac{1}{3}$ in. long, hairy; scales at the base inside very short. Corolla $1\frac{1}{2}$ in. in diameter. Female fl.: Peduncle long, slender, sometimes 2-flowered. Flower much smaller than the male. Ovary very slender, fusiform, pilose. Fruit 1 in. long, terete, with a long straight beak. Seeds $\frac{1}{4}$ in. long.

Mozamb. Distr. Between Senna and Lupata, and near Shigogo on the Shire, *Dr. Kirk!* (with good analysis.)

2. **R. Welwitschii,** *Hook. f.* "Annual, prostrate." (*Welw.*) Nearly glabrous. Leaves rather coriaceous, broadly ovate-cordate, acuminate, obscurely 3-lobed, obtusely toothed; basal sinus narrow or closed. Male fl.: Peduncles 1 in., glabrous, 3–5-flowered at the apex; pedicels short, pilose; buds nodding. Calyx-lobes pilose. narrow lanceolate, $\frac{1}{3}$ in. long, gradually acuminate, scales at the base inside prominent, incurved. Corolla about 1 in. in diameter. Stamens 4, one 2-celled with a 2-partite connective, the other three contiguous each 1-celled, central with a broad connective surrounded by the flexuous anther-cells, the two lateral much smaller, clavate, with unilateral anther-cells. Female fl.: Peduncle very short. Calyx-lobes narrow, subulate. Ovary very slender, 1 in. long. Fruit not seen.

Lower Guinea. Mossamedes, open sandy plains near the Bero river, *Dr. Welwitsch!* One specimen only seen.

The stamens may be more properly regarded as 2, one 2-celled, with a 2-lobed anther, the other 3-celled and divided to the base into three 1-celled stamens. These three are all inserted between two of the scales.

16. **CUCUMIS**, Linn.; Benth. et Hook. f. Gen. Plant. i. 826.

Monœcious, rarely dicecious. Male fl.: Fascicled or solitary. Calyx-tube short; lobes subulate. Corolla campanulate, deeply 5-lobed or -parted, lobes acute. Filaments short, free, inserted within the calyx-tube; anthers oblong, one 1-celled, two 2-celled; cells flexuous or conduplicate, rarely straight or curved, connective produced and papillose at the apex. Rudiment of ovary glandular. Female fl.: Solitary. Staminodes 0 or subulate or reduced to glands. Ovary ovoid or globose; style short, stigmas 3, sessile, 2-lobed, obtuse; ovules many, on 3 or 5 placentas. Fruit subglobose, cylindric, terete or 3-gonous, smooth warted or spiny, sometimes 3-valved. Seeds many, oblong, compressed.—Annual or perennial-rooted, prostrate or climbing, hispid or scabrid herbs. Leaves entire lobed palmate or pedate. Tendrils simple, sometimes reduced to spines. Flowers yellow, usually small.

An abundant tropical African genus, the species of which are very variable indeed and difficult of identification. I have followed Naudin in the main in the method of treating them, accepting his identifications and synonyms of the known species in almost all cases. I recognise two forms of seed in the genus. One lenticular elliptic-ovoid, compressed, quite smooth, with convex surfaces and rounded not thickened margins; the other (confined to *C. membranifolius* and *C. subsericeus*) obovoid, contracted just above the truncate small base, with thickened margins and depressed disk. Probably the division into smooth and spinous fruited is not good, for the spines vary much in number and size on each species.

A. Fruit echinate spinous or tubercled.
* Stem hispid, with long slender brittle hairs or bristles.
Ovary prickly. Fruit elongate, with scattered tubercles . . 1. *C. sativus.*
Ovary prickly. Fruit ovoid, with long large conical processes . 2. *C. metuliferus.*
Ovary tomentose. Fruit subglobose, with soft spines . . . 3. *C. dipsaceus.*
** Stem scabrid, with short white hairs and stout prickles.
Leaves very scabrid, usually deeply 5–7-lobed.
Green. Ovary aculeate. Fruit ½ in. densely spiny . . . 4. *C. Figarei.*
Ashy white. Ovary aculeate. Fruit 1½–2½ in., with distant stout spines . . . . . 5. *C. pustulatus.*
Ashy white. Ovary aculeate. Fruit striped, 1 in., with soft spines . . . . . 6. *C. Prophetarum.*
Leaves entire or shallowly palmately lobed, not very scabrid.
Leaves rather coriaceous, very hairy . . . . . 7. *C. subsericeus.*
Leaves very membranous, slightly hispid . . . . . 8. *C. membranifolius.*
B. Fruit smooth, glabrous or pubescent.
Ovary villous with dense white hairs, not prickly.
Leaves green, broad, rounded, and lobed . . . . . 9. *C. Melo.*
Leaves white, very scabrid, sagittate . . . . . 10. *C. sagittatus?*
Ovary hispid, with acicular bristles . . . . . 11. *C. hirsutus.*
Ovary aculeate, and also with acicular bristles . . . . . 12. *C. longipes.*

1. **C. sativus,** *Linn.; Naud. in Ann. Sc. Nat. sér.* 4; xi. 27. Annual; usually monœcious. Stem angular, sparingly branched, and petioles and peduncles covered with spreading stiff hairs or bristles. Leaves hispid, membranous, bright green, shortly palmately 3–5-lobed, lobes triangular-ovate, acute or acuminate. Female fl.: Peduncle stout. Ovary narrow oblong, muricate with tumid rigid pungent prickles. Fruit very variable in length and breadth, fusiform, ob-

scurely 3-gonous, yellow-green, glabrous, covered with distant rounded tubercles.

Tropical Africa, cultivated in Abyssinia and elsewhere. The native country of the cucumber is unknown. Can it be a form of *C. metuliferus?*

2. **C. metuliferus,** *E. Mey. in Herb. Drege, Harv. et Sond. Fl. Cap.* ii. 495. Annual, deep green. Stem slender, angled, and petioles and peduncles hispid with stiff white spreading penetrating bristles. Leaves membranous, as long as or longer than broad, 2–4 in. diameter, palmately 3–5-lobed, pubescent with appressed stiffish hairs above, below subscabrid; lobes short, triangular, acute, irregularly toothed. Tendrils stout. Male fl.: Calyx hispid. Anthers ciliate; connective produced into a short broad glandular appendage. Female fl.: Ovary covered with strong stout tumid prickles. Fruit 3–5 in. long, obscurely 3-gonous, oblong, fleshy, smooth, armed with few scattered long thick conical hard-tipped $\frac{1}{2}$ in. spines, orange-red. Seeds (not seen) enveloped in a fleshy sac (*Kirk*)—Naud. in Ann. Sc. Nat. sér. 4, xi. 10. *O. Tinneanus*, Kotschy et Peyr. Pl. Tinn. t. viii.

Upper Guinea. Niger river, Borgu, *Barter!*
Nile Land. Abyssinia, *Schimper!*
Lower Guinea. Angola, Golungo Alto, Ambriz, and Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Shumpanga, Shire river, &c., *Dr. Kirk!* (with good analysis and notes.)

Also found in Natal. Barter describes the fruit as bitter.

3. **C. dipsaceus,** *Ehrenb. in Naud. l.c.* 25. Annual, pale bright green. Stem slender, angled, and petioles and peduncles hispid with slender stiff bristles. Leaves membranous, $2\frac{1}{2}$–4 in. broad, rounded or oblong-reniform, obtusely 3–5-sinuate or -lobed or quite entire, very slightly toothed, shortly scabrid on both surfaces. Tendrils rather stiff below the middle. Male fl.: Calyx villous with soft spreading hairs. Anthers with the connective produced into a long flat gland-tipped appendage. Female fl.: very shortly peduncled. Ovary covered densely with soft white velvety hairs. Fruit broadly ovoid, $\frac{1}{2}$ in. long, most densely clothed with soft spreading spines. Seeds small, $\frac{1}{6}$ in. long, elliptic-oblong, pale brown, smooth, without thickened border or depressed disk.—Naud. l.c., *C. Bardana*, Fenzl in Kotschy It. Nub. n. 99; *C. cognata*, Fenzl, l.c. 107; *C. ambigua*, Fenzl, l.c. 352; *Momordica dasycarpa*, Hochst. in Schimp. Hb. Abyss. No. 1419; *C. Chate*, L.; Schweinfurth, Hb. Gallabat, n. 108.

Upper Guinea. Gambia, *Ingram!*
Nile Land. Khartoum, *Bromfield!* Abyssinia, *Schimper!* Nubia, *Kotschy!* Gallabat, *Schweinfurth!*

Pulp intensely bitter, according to Naudin. The ovary densely covered with white wool, resembles *C. Melo*, from forms of which I fancy it would be difficult to distinguish flowering specimens. I have seen no fruits of *C. cognata* and *ambigua*, but have found no reason to doubt their specific identity with either this or *C. Melo*.

Schweinfurth (Pl. Nilot. 17) refers *C. ambigua*, Fenzl, to *C. Chate*, L. (a form of *C. Melo*), and *C. Bardana*, Fenzl, to *C. sativus*, L. (Fl. Æthiop. 63), possibly correctly.

4. **C. Figarei,** *Delile in Cat. Hort. Monsp. ex Naud. l.c.* 16. Peren-

nial. Stem slender, angled; petioles and peduncles scabrid with stiff white prickles. Leaves very variable, coriaceous, very scabrid, 1–2 in. in diameter, generally longer than broad, 3–7-lobed to or below the middle, sinus dilated and rounded at the base; lobes obovate, acutely toothed, rounded or acute; petioles rather short. Tendrils short, rather stiff. Male fl.: Calyx hispid. Anthers with long projecting gland-tipped connectives, obscurely ciliate. Female fl.: Stigmas sessile, oblong-obcordate. Ovary densely clothed with stiff, short, conic, rigid setæ, each with a transparent pungent tip. Fruit $1\frac{1}{2}$ in. long, broadly ovoid, yellow, densely clothed with soft spines $\frac{1}{3}$ in. long. Seeds small, $\frac{1}{6}$ in. long, elliptic-oblong, smooth, white or pale brown, without thickened margins or depressed disk.—*C. ficifolius*, A. Rich. Fl. Abyss. i. 294, t. 53 *bis*, *et C. abyssinicus*, A. Rich. l.c. ex Naudin. *? C. chrysocomus*, Schum. et Thonn. Pl. Guin. 427.

Nile Land. Abyssinia, *Quartin-Dillon, Petit!*
Lower Guinea. Loanda, on sandy sea-shores, *Dr. Welwitsch!*
Mozamb. Distr. Above Senna, *Dr. Kirk!*

Welwitsch's specimens have more scattered spines than Kirk's, or the Abyssinian, or than Natal ones grown in the Paris garden. Welwitsch describes the plant as an annual, and the fruit as tasting of cucumber: Naudin, as bitter. The latter describes 5 forms: *a. ficifolius* (Abyssinia and Arabia), with leaves like those of *Ficus Carica*, long female peduncles and scattered tubercles, rarely spines on the fruit. *b. microphyllus* (Abyssinia), smaller, leaves of form and colour of *C. Prophetarum*, fruit shortly peduncled, muricate, or obscurely tubercled. *c. cyrtopodus*, n. sp (Abyssinia), leaves villous-hispid, ovary on short slender peduncle, clothed with fine hairs; unripe fruit hardly muricate. *d. echinophorus* (Arabia), leaves of *a*, but ashy white, female flower very small, fruit covered with long spines, peduncle long, slender *c. dissectus* (Abyssinia), leaves divided nearly to the base into narrow lobes, peduncle and fruit of *d*.

5. **C. pustulatus,** *Hook. f.* (*C. Figarei* var. *pustulatus, Naud. ms.?*) Perennial. Hoary and scabrid. Stem rather stout, angled, rigid, beset with short white prickles. Leaves $\frac{1}{2}$–2 in. in diameter, coriaceous, very variable, oblong rounded or cordate, subentire or more or less deeply 3–5-lobed, lobes obtuse, quite entire or toothed; petioles rather short. Tendrils short, rather rigid. Male fl.: Calyx campanulate, shortly scabrid. Connective shortly produced into a broad glandular appendage. Female fl.: Ovary covered with short stout prickles. Fruit on very stout peduncles, $1\frac{1}{2}$–3 in. long, broadly ovoid, rounded at both ends, covered with scattered, thick, conical tubercles or spines. Seeds small, $\frac{1}{6}$ in., whitish, smooth, elliptic-oblong, without thickened border or depressed disk.—*C. abyssinicus*, Schimp. Hb. Abyss. n. 412. (1853 ex. herb. Mus. Par.) in A. Rich. Fl. Abyss. i. 294. *? Cucumis striatus*, A. Rich. l.c. 295.

North Central. Kouka, *Vogel!*
Nile Land. Abyssinia, *Roth! Schimper!* n. 835 (1863–8).

I refer here a plant differing remarkably from *C. Prophetarum* in the large size and stout processes of the fruit, and in its very stout peduncle. One of the Abyssinian specimens, which has fruit 3 in. long, is labelled in Herb. Hook. *C. Figarei*, Del.; and another, with fruit $1\frac{1}{2}$ in., is mentioned as *C. Propheturum* by Naudin in Ann. Sc. Nat. (sér. 4. xi. 16.) I assume Naudin's *C. Figarei*, var. *pustulatus* to be the same; it is a large-leaved form, cultivated in the Jardin des Plantes, of which I have seen no fruit. I gathered *C. pustulatus* at Aden in 1847 and 1851. The fruit of the Aden specimen is scabrid as well as aculeate, which is not the case in others from Arabia Petræa.

6. **C. Prophetarum,** *Linn.*; *Naud. l.c.* 14. Annual. White, or ashy and scabrid with stiff hairs. Stem much branched from the base, geniculate at the nodes, angular, and petioles and peduncles clothed with short, white, stout, little bristles. Leaves small, $\frac{1}{4}$–$1\frac{1}{4}$ in. broad, scabrid on both surfaces, subtriangular reniform or palmately 3–5-lobed, coriaceous; lobes short or long, quite entire or toothed, obtuse or acute; base truncate or more or less deeply cordate; petioles short or long, tendrils short. Male fl.: Calyx and corolla hispid. Connective produced into a linear, flat, simple or 2-fid appendage, glandular at the tip. Female fl.: Peduncles stout, short, covered with short, stout, rigid, pungent prickles. Staminodes linear. Stigmas short, 2-lobed. Fruit broadly ovoid, 1–$1\frac{1}{2}$ in. long, green with pale vertical bands, covered with scattered, soft, slender spines. Seeds small, $\frac{1}{6}$ in. long, elliptic-oblong, compressed, smooth, brownish, without thickened margin or depressed disk.—*C. arabicus,* Delile in Hort. Monsp. (ex. Naud.) *C. amarus,* Stocks.

Nile Land. Abyssinia, *Roth!* Egypt, between Cosseir and Ras-Benass, *Schweinfurth!*

Lower Guinea. Benguela and Mossamedes, on sandy sea-shores, *Dr. Welwitsch!* A very slender and small-leaved variety.

Fruit bitter, according to Naudin. The South African representative of this is the *C. myriocarpus,* Naud., which differs chiefly in habit and the slender pedicels and deciduous fruit. Except in its hispidity and ashy hairs, *C. Prophetarum* approaches very closely to the supposed American *C. Anguria,* L. All have small male flowers, with produced connectives, staminodes in the female flower, and small oblong berries striped green and orange and loosely set with weak spines. I should not be surprised if *C. Figarei, pustulatus,* and *Prophetarum* proved to belong to one species, of which *C. Anguria* is a cultivated state imported by the negroes into the West Indies (see Bot. Mag. t. 5817).

7. **C. subsericeus,** *Hook. f.* Annual, green. Stem very slender, weak, sparingly branched, slightly scabrid here and there. Leaves small, 1–$1\frac{1}{2}$ in. broad, broadly ovate-cordate or subreniform, palmately 3–5-lobed; lobes short, broad, triangular, obtuse or acute, obscurely toothed, covered on both sides with rather silky appressed hairs; petioles 1–$1\frac{1}{2}$ in. Tendrils very slender. Male fl.: Small. Calyx hispid. Anther-cells ciliate; connective shortly produced. Female fl.: Peduncles hispid. Ovary ovoid, covered with hispid hairs. Stamens 3; anthers fully formed, but thin and without pollen. Fruit immature, ovoid, 1 in. long, on a stout peduncle, covered with both slender tuberous-based bristles and stout, green, conical spines. Seeds rather narrow, white, with a stout thickened border and depressed disk.

Lower Guinea. Angola, Pungo Andongo, thickets in a sandy soil, *Dr. Welwitsch!* A very distinct-looking plant.

8. **C. membranifolius,** *Hook. f.* Annual?; flaccid, bright green. Stem slender, scabrid, sulcate, sparingly branched. Leaves very membranous, 2–$2\frac{1}{2}$ in. in diameter, broadly ovate-cordate, palmately 5-lobed or angled; angles or lobes broad, triangular, acuminate, slightly irregularly toothed, slightly scabrid on both surfaces, basal sinus shallow; petioles longer than the blade. Male fl.: Not seen. Female

fl.: Peduncles short, stout, densely hispid with spreading brown hairs. Fruit small, $\frac{1}{2}$–$\frac{3}{4}$ in., broadly ovoid, both aculeate and densely clothed with acicular brown bristles. Seeds many, white, ovate, contracted above the truncate base, $\frac{1}{4}$ in. long, with a broad thickened border and depressed disk.

Nile Land. Abyssinia in Tigre, *Schimper*, 1457 (1863–8)! A very distinct species.

9. **C. Melo,** *Linn. Sp. Pl.* 1436. Pale green. Stems short, slender, angular, scabrid with short, straight and curved prickles. Leaves $\frac{1}{2}$–1 in. long, coriaceous, reniform-cordate or ovate, palmately 3–5-lobed, lobes rounded, obtuse, irregularly toothed and waved, scabrid on both surfaces with white papillæ. Male fl.: Small. Anthers ciliate, connective produced into a serrate oblong appendage. Female fl.: Peduncle short. Ovary clothed with silky appressed hairs. Fruit globose, sweet, edible, $\frac{3}{4}$ in. diameter, softly hairy, greenish-yellow. Seeds $\frac{1}{6}$ in. long, elliptic-oblong, smooth, pale brown, without thickened margins or depressed disk. ? *C. madraspatanus*, Roxb. Fl. Ind. iii. 723 (not of Linn.) ? *C. arenarius*, Schum. et Thonn. Pl. Guin. 427.

Upper Guinea. Borgu, on the Niger, on sandy places, *Barter!*
Nile Land. Abyssinia, *Roth!* Æthiopia, *Kotschy!* Nubia, *Petherick!*

This is undoubtedly one of the forms of small wild melon indicated by Naudin, and very close to the *C. madraspatanus*, Roxb., *pubescens*, Willd., and *turbinatus*, Roxb., of India, and is one of the natural races included by Naudin in his 7th tribe of *C. Melo Chito*. Barter describes the fruit as eaten, and called Boange by the Nupe people, and of the flavour of a "green flesh melon." It is very probable that some of the plants included under *C. dipsaceus* may also be referable to *C. Melo*, but without fruit it is impossible to determine.

10. **C. sagittatus,** *Wawr. et Peyr., Sert. Benguel.* 27. Annual? Scabrid and white with minute close-set small prickles. Stem very slender, much branched, angular, angles white. Leaves small, 1 in. long, sagittate, sinuate-toothed, very scabrid on both surfaces, sometimes almost silky with stiff white appressed hairs, basal sinus rather acute, lobes spreading, lobulate or entire; petioles $\frac{1}{2}$–$\frac{3}{4}$ in., tendrils very slender. Male fl.: Small; peduncles very short. Calyx hispid. Anthers short, ciliate; connective produced into a rather long flat appendage, glandular at the tip. Female fl.: Small, almost sessile. Ovary densely clothed with soft straight snow-white hairs. Fruit short, peduncled; unripe globose, green, silky; ripe 2 in. long, green with yellow stripes, quite smooth and glabrous.

Lower Guinea. Benguela, *Wawra!* Mossamedes, sandy maritime shores of the Bero river, *Dr. Welwitsch!*

Apparently a well-marked species, of which a fragment only of the fruit is preserved. Welwitsch describes it as variable in the form and hairiness of the leaves.

11. **C. hirsutus,** *Sond. in Fl. Cap.* ii. 497. Perennial; dicœcious; dark greenish-brown when dry, hirsute all over, old specimens more scabrid. Root tuberous (*Welw.*). Stem rather stiff, angular, and petioles and peduncles hispid with long spreading slender stiff hairs.

Leaves very variable, usually 3–5 in. long, narrow oblong or oblong-ovate or lanceolate, obtusely sinuate-lobed and denticulate, acute obtuse or retuse with 3 principal nerves, base rounded or cordate, hirsute with appressed sometimes almost silky hairs on both surfaces, more rarely cordate or palmately deeply 3–5-lobed; petioles stout. Tendrils slender. Male fl.: Very variable in size, $\frac{1}{3}$–1 in. diameter; peduncles slender, long or short, 1–5-flowered, ebracteate; pedicels slender. Calyx villous, with long soft spreading hairs. Anthers ciliate, connective produced into a flat irregular ciliate appendage, not thickened at the tip. Female fl.: Solitary. Ovary densely villous with soft spreading hairs. Staminodes minute. Fruit on a stout peduncle, subglobose, $1\frac{1}{2}$ in. diameter, nearly smooth, with a few scattered hairs, mottled green and white? Seeds very small, $\frac{1}{6}$ in. long, broadly ovoid, acute at one end, with a small depression in the disk.

Lower Guinea. Angola, in sandy thickets, *Dr. Welwitsch!*
Mozamb. Distr. Moramballa and between Tette and the coast, in light soil, *Dr. Kirk!*

A very distinct species, at once recognised by its colour and peculiar long subentire leaves. The flowers vary excessively in size, and the males are more paniculate in Kirk's than in Angolan or Natal specimens. The anthers are more ciliate in the Angola specimens than in the Natal, and appendages longer and also ciliate. According to Sonder, the fruit is edible and acidulous.

12. **C. longipes,** *Hook. f.* Annual? Monœcious; prostrate, pale green, flaccid, slightly scabrid. Stems slender, angled, scabrid with short stiff aculei. Leaves 2–4 in. long, as in *C. ficifolius*, cut deeply into 5–7 obovate rounded toothed lobes, scabrous on both surfaces; petioles rather long. Tendrils very slender. Male fl.: Peduncles slender, simple or branched at the base. Calyx hispid. Anthers ciliate, connective with a produced flat glandular appendage. Female fl.: Peduncle 2–4 in. stout, hispid. Ovary echinate with short stiff prickles. Staminodes subulate. Berry oblong, 2 in. long, on a stout curved peduncle 3–5 in., rounded at both ends, quite smooth and glabrous except for a very few small scattered prickles. Seeds very small, $\frac{1}{6}$ in. long, elliptic-oblong, pale brown, smooth, margins rounded, not thickened, disk not depressed.

Lower Guinea. Angola, in thickets, Golungo Alto, Cazengo, on the sea-shore and in and about the town of Loanda, *Dr. Welwitsch!*

A very distinct species in fruit, though undistinguishable in foliage and flowers from *C. Anguria, Figarei*, &c.

Welwitsch describes the fruit as tasting like cucumber.

C.? striatus, A. Rich. Fl. Abyss. i. 295, is unknown to me; the leaves are digitately 5-partite, fruit the size of a large walnut, smooth, glabrous, with 10 striæ; the flowers are unknown. Schweinfurth (Plant. Nilot. 17) describes the male flower, but does not detail the structure of the stamens, and considers it as possibly a *Cucurbita*.

There are various other indeterminable species of *Cucumis* in the Tropical African collections at Kew; amongst the principal is the following from sandy shores, Mossamedes, Lower Guinea, *Dr Welwitsch* (n. 831). A large green scabrid species, with long stout-petioled hastate cordate acute leaves, 2 in. long and broad, hispidly scabrid on both surfaces; male flowers, peduncle $\frac{1}{3}$ in. diameter; female larger on slender pedicels; ovary oblong, densely clothed with silky white hairs.

17. **OREOSYCE,** Hook. f.

Flowers monœcious, subsolitary. Male: Calyx-tube cylindric-campanulate, hispid; teeth 5, subulate. Corolla rotate, tube short; lobes oblong, obtuse. Stamens 3, peltately attached to the middle of the calyx-tube; filaments very short; anthers cohering, small, one 2-celled, two 2-celled; cells straight, narrow, contiguous, obtuse; connective not produced. Rudiment of ovary glandular. Female fl.: Staminodes 3, short. Ovary fusiform, scabrid; style columnar, inserted in a cupular disk, stigma subcapitate, 3-lobed; ovules numerous on 3 placentas. Fruit unknown.—A very slender hispid scandent herb. Leaves on slender petioles, ovate-cordate, obscurely 3–5-lobed and irregularly toothed. Tendrils slender, simple. Flowers small, yellow, on short pedicels.

1. **O. africana,** *Hook. f.* Altogether hispid or subscabrid with short stiff white hairs. Stems climbing 10–12 ft., very slender, grooved and angled. Leaves 2–3 in. long, bright green, rather membranous, narrowly ovate or triangular-cordate, basal sinus usually deep and rounded, lateral lobes short, acute, terminal produced, gradually tapering to the very acute apex. Flowers densely hispid. Calyx-tube $\frac{1}{4}$ in. long. Corolla scarcely $\frac{1}{2}$ in. diameter, young fruit ovoid, densely hispid, $\frac{1}{4}$ in. long, on a stout decurved pedicel.

Upper Guinea. Fernando Po and Camaroons mountain, alt. 7000–8000 ft. *Mann!*

Probably allied to *Cucumis* in most characters; but very distinct in the peltately sessile anthers, which have straight contiguous cells, and no produced connective.

18. **CITRULLUS,** Schrad.; Benth. et Hook. f. Gen. Plant. i. 826.

Flowers all solitary; monœcious. Male: Calyx-tube campanulate; lobes 5. Corolla campanulate, 5-lobed to below the middle, lobes obtuse. Filaments 3, very short, free, inserted within the tube; anthers slightly cohering, one 1-celled, two 2-celled; cells linear, flexuous, bordering the broad connective which is not produced beyond the cells. Rudiment of ovary gland-like. Female fl.: Staminodes ligulate or setaceous. Ovary ovoid or globose; style short, stigma 3-lobed; ovules numerous, on 3 placentas. Fruit globose, usually hard, smooth. Seeds many, oblong, compressed, smooth.—Annual, rarely perennial herbs, fœtid or musky, rarely scandent. Leaves deeply lobed; lobes narrow. Tendrils usually 2–3-fid. Flowers shortly pedunculed, yellow. Fruit usually large.

Leaves scabrid. Tendrils slender. Fruit intensely bitter . .	1. *C. Colocynthis.*
Leaves not scabrid. Tendrils slender. Fruit sweet or slightly bitter	2. *C. vulgaris.*
Leaves very scabrid. Tendrils spinescent	3. *C. Naudinianus.*

1. **C. Colocynthis,** *Schrad.; Naud. in Ann. Sc. Nat. sér.* 4, xii. 99. Root perennial. Stem angular, scabrid. Leaves triangular-ovate in outline, 2–4 in. long, 7-lobed, or 3-lobed with the middle lobe ovate,

the lobes pinnatifid or sinuate-lobulate, scabrid on both surfaces. Male fl.: $\frac{1}{2}$ in. diameter. Petals broad. Female fl.: Ovary villous. Fruit globose, variegated green and yellow, as large as an orange; pulp dry, intensely bitter. Seeds small, $\frac{1}{6}$–$\frac{1}{4}$ in., lenticular, smooth.

Nile Land. Nubia, *Bromfield! Hartmann!* Upper Egypt, *Schweinfurth!*
A common Indian plant, also found in Spain and Egypt, Arabia, and the Cape de Verde islands.

2. **C. vulgaris,** *Schrad.; Naud. l.c.* 100. Annual. Stem glabrous or woolly. Leaves and flowers much as in *C. Colocynthis*, but the former more membranous, greener, not scabrid, glabrous or slightly hairy. Fruit variable in size from that of an apple to a man's head, and in colouring green or striped or marbled, bitter or sweet. Seeds variable in form and colour.—*C. amarus*, Schrad. in Linnæa, xii. 412.

Upper Guinea. Niger river, in cultivated ground at Nupe (fruit intensely bitter), *Barter!* Gambia, *Ingram!*
Nile Land. Sennaar, &c., *Hartmann.*
Lower Guinea. Angola, wild, near Mossamedes and Huilla (fruit bitter).
Mozamb. Distr. Above Lupata (cultivated), *Dr. Kirk!*

3. **C. Naudinianus,** (*Cucumis Naudinianus, in part*) *Sonder in Fl. Cap.* ii. 496. Root perennial (*Sonder*). Stem trailing, scabrid and pubescent. Leaves as in *C. Colocynthis.* Tendrils reduced to spines. Fruit unknown.

South Central. *T. Baines!*
A curious form, of which I have seen male flowers only. South African specimens of it occur mixed with those of *Cucumis dissectifolius*, Naud. in Herb. Hook. Sonder's *C. Naudinianus* consists of flowering specimens of this and fruiting of *C. dissectifolius*, Naud.; these two plants being so similar that the flowers (themselves black and obscure) alone distinguish them. It is probably a desert form of *C. Colocynthis* or *C. vulgaris.*

19. DIMORPHOCHLAMYS, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 827.

Dioecious. Flowers very dissimilar. Male fl.: Fascicled; pedicels broadly winged. Calyx-tube very short; lobes 5, broad. Corolla 5-partite, segments linear-oblong, obtuse. Filaments 3, free; anthers connate, one 1-celled, two 2-celled, cells conduplicate. Rudiment of ovary 0. Female fl.: Solitary? Peduncles not winged. Calyx-limb produced above the ovary into a slender stipes; segments 5, linear, spreading, persistent and reflexed over the fruit. Staminodes 0. Ovary ovoid, narrowed at the apex; style columnar; stigmas 3, large, peltate, 2-lobed; ovules numerous, on 3 placentas. Fruit globose; bark hard, granulate, crowned with the radiating appressed calyx-lobes. Seeds many, large, oblong, curved, compressed, 3-fid at the apex; testa black, crustaceous, wrinkled.—A climbing shrub. Leaves short-petioled, ovate-cordate, acuminate, toothed, coriaceous, scabrid. Tendrils simple or 2-fid. Flowers rather large; peduncle with many coriaceous imbricate bracts at the apex. Fruit as large as an orange.

1. **D. Mannii,** *Hook. f. l.c.* Stem slender, angular, very faintly scabrid. Leaves rigid, 3–5 in. long, 3-nerved at the base, variable in breadth, teeth small, distant, often setose, nerves prominent beneath, much reticulated. Male fl.: Calyx turbinate, 2-winged, the wings reticulate and extending from the base of the pedicel to the back of the lobes, hence pedicel and wings together are obcordate in outline, $\frac{3}{4}$ in. in diameter; lobes $\frac{1}{4}$ in. long. Corolla 1 in. long, campanulate. Fruit $2\frac{1}{2}$ in. in diameter, crowned with linear calyx-lobes 1 in. long.

Upper Guinea. Fernando Po, Bagroo river, Old Calabar and Ambas bay, *Vogel! Mann! Rev. W. C. Thomson!*

20. **CEPHALANDRA,** Schrad.; Benth. et Hook. f. Gen. Plant. i. 827.

Flowers usually diœcious. Male fl.: Solitary or subcymose at the apex of a slender peduncle. Calyx short, campanulate or turbinate, 5-toothed. Corolla campanulate, shortly acutely 5-lobed. Filaments 3, inserted in the bottom of the calyx-tube, connate, rarely free; anthers connate or cohering, cells conduplicate. Rudiment of ovary 0. Female fl.: Solitary. Staminodes short or long. Ovary ovoid oblong or linear; style slender; stigmas 3-lobed or partite; ovules numerous on 3 placentas. Berry cylindric or oblong, terete. Seeds numerous, ovate, compressed, margined; testa smooth or rough.—Slender, prostrate or climbing, glabrous or scabrid herbs; root (always?) tuberous. Leaves angled or lobed, sometimes glandular. Tendrils undivided. Flowers white or yellow, large or small. Fruit rather small, very fleshy.

Male peduncles 1-flowered.	
Leaves palmately slightly 5-lobed or -angled	1. *C. Indica.*
Leaves digitately deeply 5-lobed	2. *C. quinqueloba.*
Male peduncles many-flowered.	
Leaves petioled, scabrid or pustulate, 5-lobed, lobes ovate-lanceolate	3. *C. diversifolia.*
Leaves petioled, very pubescent, 5–7-lobed, lobes linear	4. *C. pubescens.*
Leaves petioled, 2-pinnatifid	5. *C. decipiens.*
Leaves sessile or subsessile, pustulate	6. *C. Senensis.*

1. **C. Indica,** *Naud. in Ann. Sc. Nat. sér.* 5, v. 16. Stem much branched, angular and grooved, slightly rough with papillæ. Leaves 2–4 in. broad, bright green, studded with green papillæ, palmately 3–5-angled or lobed; basal sinus deep or shallow; lobes broad, ovate, acute or obtuse and apiculate, more or less sinuate-toothed; a few circular glands are placed at the base of the leaf between the nerves; petioles as long as or shorter than the leaves. Male fl.: Peduncles 1-flowered, shorter than the petioles, very slender, jointed below the flower. Calyx broadly obconic; lobes subulate. Corolla 1 in. long. Fruit oblong or cylindric, bright red marbled with white, $\frac{1}{2}$–$1\frac{1}{2}$ in. long.—*Coccinia indica,* Wight Ill. ii. t. 105; Hook. Ic. Pl. t. 138; A. Rich. Fl. Abyss. i. 290. *C. Schimperi,* Naud. in Ann. Sc. Nat. sér.

4, xii. 116. *C. Moghadd*, Ascherson in Schweinf. Pl. Nub. No. 85. *Cucurbita exanthematica*, Fenzl, Pl. Kotschy. n. 808; A. Rich. Fl. Abyss. i. 296.

Nile Land. Abyssinia, *Dillon!* Nubia, *Kotschy!* Upper Nile, *Grant!*
Upper Guinea. Senegambia, *Naudin in Herb. Gay.* Confluence of Quorra and Tchadda, *Barter!*
An abundant Indian plant.

2. **C. quinqueloba,** *Schrad.; Naud. in Ann. Sc. Nat. sér.* 5, v. 16. Stem angular, grooved, smooth, not papillose. Leaves membranous, 3–5 in. broad, bright green, studded with green papillæ, digitately 5-lobed to near the base, basal sinus usually broad and open; lobes much waved or lobulate, obscurely toothed, obtuse and apiculate, middle one often much longest; petiole shorter than the blade; glands circular between the base of the nerves. Flowers much as in *C. Indica*, fruit not seen, "oblong-ovoid" (Kotschy).—Bot. Mag. t. 1820; Bot. Reg. t. 82. *Coccinia palmatisecta*, Kotschy, Pl. Bind. 11. t. 4.

Nile Land. *Binder.* Banks of White Nile, *Petherick! Grant!*
Mozamb. Distr. Rovuma river, *Dr. Kirk!* (A form with entire leaf-lobes; specimen insufficient.) Fruit eatable, *Kotschy, l.c.* Also a South African species, the specimens of which have usually more sessile, less deeply lobed leaves.

3. **C. diversifolia,** *Naud. in Ann. Sc. Nat. sér.* 5, v. 18, t. 1. Monœcious or diœcious; hispidly pubescent. Root stout, fusiform. Stems and branches slender, glabrous, angled, furrowed, pilose. Leaves 1½–6 in. broad, rather membranous, eglandular at the base, upper ovate-cordate, acuminate, toothed, lower palmately deeply 3–5-lobed, hispid on both surfaces, especially on the nerves beneath; lobes ovate-lanceolate, contracted at the base, acuminate, toothed; sinus rounded; petioles shorter than the blade, hispid. Male fl.: Peduncles longer than the leaves, pilose, 5–6-flowered at the apex; pedicels short or long. Calyx hispid; lobes subulate. Corolla broadly campanulate, ⅔ in. long and broad. Filaments partially free. Female fl.: Peduncles short. Ovary hairy. Fruit ovoid, red marbled with white or yellowish in lines.—*Coccinia Hartmanniana*, Schweinf. Reliq. Kotschy. 42, t. 27, 28.

Nile Land. Abyssinia, *Schimper!*
I think that Schimper's No. 331, of 1853, labelled *C. exanthematica*, belongs here, the leaves are much larger, and the plant more hairy than in Naudin's cultivated specimens. I have what appears to be a more glabrous form of this plant from Hort. Bot. Petrop., labelled *Coccinia Indica*, which it certainly is not. *C. palmata*, Sonder, of S. Africa, is very closely allied.

4. **C. pubescens,** *Sond. in Fl. Cap.* ii. 493? Stem glabrous or pilose with soft spreading hairs, angular and grooved. Leaves 2–3 in. long, rather coriaceous, pale beneath, pubescent with short hairs, scarcely scabrous or hispid on both surfaces, eglandular at the base, deeply digitately 5–7-lobed, lobes narrow, linear-oblong or lanceolate, sharply serrate and often lobed, the middle lobe longest; sinus obtuse; petiole shorter than the blade. Male fl.: Rather crowded at the end of

a short peduncle; pedicels stout, pubescent. Fruit oblong, 1 in. long. —*Momordica Adoensis*, Hochst. in Schimp. Hb. Abyss. No. 166. *Cucurbita sp.* Schimp. No. 1049 (1853). *Cucumis? striatus*, A. Rich. Schimp. Hb. Abyss. 330 (1853).

Not having fruiting specimens of the Cape plant, I refer this doubtfully to it.

5. **C. decipiens,** *Hook. f.* Stem slender, angular, grooved, glabrous. Leaves membranous, 3 in. in diameter, green, 2-pinnatifid, being cut to the base into 3 narrow spreading segments, that are oblong-lanceolate in outline, deeply irregularly pinnatifid, with spreading lobulate acute divisions, upper surface covered with white papillæ, hardly scabrid, lower smooth; petiole 1–1½ in. long. Male fl.: Minute, very numerous on long capillary pedicels 1 in. long, that are racemed on a very short common peduncle. Calyx very short; lobes recurved. Corolla broadly campanulate, 1–10th. in. in diameter. Filaments almost free. Female fl.: Very minute, shortly peduncled. Ovary fusiform. Fruit solitary or clustered, subsessile, broadly ovoid, rostrate, 1 in. long, "orange-yellow with white spots" (*Welwitsch*). Seeds immature.

Lower Guinea. Pungo Andongo. Climbing amongst grass, *Dr. Welwitsch!*

A most curious species, with the foliage and fruit so like a *Rhynchocarpa* that without an analysis of the minute male flower it is difficult to believe it a *Cephalandra.*

6. **C. Senensis,** *Klotzsch in Peters' Mossamb. Bot.* 151. Stem slender; branches angular, grooved, sparingly clothed with spreading hairs. Leaves dark green, very shortly petioled, membranous, 3–5 in. broad, palmately 3–5-lobed to the middle or above it, minutely papillose and slightly scabrid with short hairs on both surfaces, glands 0 between the veins; lobes broadly oblong, acute or obtuse, mucronate, entire or toothed here and there; petiole hispid, ⅛–¼ in. long. Male fl.: Peduncles rather longer than the petioles, 4–6-flowered, and short pedicels and calyx hispid or pilose. Calyx-lobes subulate. Female fl.: Peduncle longer or shorter than the male. Ovary slender, glabrous. Fruit immature, oblong, subacute at both ends, 1¼ in. long.

Mozamb. Distr. Sena, *Peters!* Lupata, Tette and Shupanga, *Dr. Kirk!*

There are two other Tropical African *Cephalandras* in the herbarium, but too imperfect to describe; one is Abyssinian, Schimper's No. 250, of 1853, another from Shupanga and Moramballa (*Kirk*), resembles *C. diversifolia*, but the leaves are almost glabrous, neither pustulate nor scabrous, the male flowers glabrous, and the fruit obovoid and glabrous.

21. **PHYSEDRA,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 827.

Dicœcious. Flowers solitary, panicled or fascicled. Male: Calyx-tube turbinate or obconic; lobes 5, setaceous, spreading. Corolla cylindric-campanulate, fleshy, 5-lobed to the middle. Filaments 3, free, inserted on the calyx-tube; anthers broad, thick, obcordate, cells conduplicate and flexuous. Rudiment of ovary 0. Female fl.: Calyx-tube turbinate above, constricted in the middle, globose at the base, lobes subulate. Staminodes thick, conical. Ovary linear-oblong; style columnar, stigma large, capitate, 3-lobed; ovules very numerous

on 3 placentas. Fruit oblong. Seeds (unripe) obovate, compressed, margined, smooth.—Climbing, tropical African, glabrous, glaucous herbs or shrubs; branches slender. Leaves shortly petioled; palmately 5–7-lobed; young ones very polymorphous. Tendrils undivided.

Male flowers on short stout pedicels, fascicled on a short stout peduncle . . . . . 1. *P. heterophylla.*
Female flowers on long slender pedicels, racemed on a long slender peduncle. . . . . 2. *P. longipes.*

1. **P. heterophylla,** *Hook. f.* Leaves very variable, 4–5 in. long, 2–5 in. broad, subdeltoid-ovate or palmately 3–5-lobed or angled, lobes short and broad, or leaf deeply 5-lobed with longer oblong acute lobes; basal sinus large and open in the simple leaves, deep and closed in the lobed ones; tips of leaves and their segments subulate and hooked, brown and hard when dry, fragile and succulent when fresh; upper surface papillose, lower covered with minute raised points; petiole very short, $\frac{1}{2}$–$\frac{3}{4}$ in. Tendrils long and stout. Male fl.: Crowded on a very short axillary peduncle, very shortly pedicelled. Calyx-tube turbinate; lobes spreading, $\frac{1}{3}$ in. long. Corolla fleshy, cylindric, $\frac{3}{4}$ in. long by $\frac{1}{2}$ in. broad, coriaceous, orange-yellow, 5-lobed to about the middle, clothed with long papillæ within. Female fl.: Solitary, or panicled on a short stout peduncle. Ovary narrow, ovoid, glabrous, $\frac{1}{2}$ in. long. Calyx-tube $\frac{1}{6}$ in. long, lobes and corolla as in the male. Fruit shortly cylindric, rounded at both ends, 1–1$\frac{1}{2}$ in. long. Seeds very numerous, 1–5th in. long.

Lower Guinea. Angola, Golungo Alto, thickets, *Dr. Welwitsch!*

Var. β. Leaves subdigitately 7-lobed below the middle, acutely serrate with long points to the serratures, and the lobes terminating in longer slender tails.

Lower Guinea. Angola, forests, *Dr. Welwitsch!*

2. **P. longipes,** *Hook. f.* Leaves 4–5 in. long and broad, palmately 5-lobed to near the base; lobes lanceolate or oblanceolate, long acuminate, quite entire, sinus narrow, two lateral spreading, falcate and deflexed, with oblique bases which approach or overlap beyond the petiole, dark brown when dry; petiole 1$\frac{1}{2}$–2 in. long. Tendrils very long and stout. Male fl., peduncles 2–4 in. long, slender, flexuous; bracts small, stout, fleshy, recurved or revolute; pedicels $\frac{1}{3}$–1 in. spreading. Male buds only seen, $\frac{1}{8}$ in. long. Calyx-tube turbinate, lobes short.

Upper Guinea. Fernando Po, *Vogel!* Sierra del Crystal, *Mann!*

22. RHAPHIDIOCYSTIS, Hook. f.; Benth. et Hook. f. Gen. Plant. i. 828.

Monœcious. Flowers solitary or fascicled and axillary. Male: Calyx campanulate; lobes 5, pectinately pinnatifid. Corolla campanulate; lobes 5, short, acute. Filaments 3, free, inserted at the base of the calyx; anthers connate, cells flexuous. Rudiments of ovary 0. Female fl. on longer pedicels. Staminodes 0. Ovary oblong or globose, hispid; style columnar, inserted in a depressed disk; stigmas 3, each with 3–5

erect subulate lobes; ovules very numerous, on 3 placentas. Fruit oblong, crowned with the persistent perianth, covered with spreading needle-like bristles, dry internally when ripe. Seeds numerous, ovoid, compressed, margin obtuse; testa coriaceous.—Climbing, slender, glabrous or hispidulous, Tropical African shrubs. Leaves on slender petioles, ovate, deeply cordate, acuminate. Tendrils undivided. Flowers rather large, yellow, on slender pedicels.

Branches glabrous or puberulous	1. *R. Mannii.*
Branches woolly	2. *R. Welwitschii.*

1. **R. Mannii,** *Hook. f. l.c.* Stem climbing extensively, glabrous or puberulous, very slender, angular. Leaves 3–4 in. long, very membranous, brown when dry, basal sinus short, rounded, more or less distinctly 3–5-lobed, lateral lobes small, terminal elongate-triangular, acuminate, obscurely distantly toothed, both surfaces slightly and shortly hispid; petiole very slender, ciliate upwards. Male fl.: Not seen. Female fl.: 2–3 together, on short peduncles that lengthen much in fruit. Ovary narrow-oblong, $\frac{1}{6}$ in. long, hispid with (when dry) ferruginous hairs. Calyx-tube campanulate, lobes recurved, pectinately branched, throat with a ring of hairs. Fruit subsessile or long-peduncled, $\frac{1}{2}$ in. long, densely clothed with stiff articulate ferruginous bristles. Seeds broadly obovoid, $\frac{1}{5}$ in. long.

Upper Guinea. Fernando Po, alt. 2000 ft., *Mann!*

2. **R. Welwitschii,** *Hook. f. l.c.* A lofty climber. Branches rather stout, peduncles, petioles, and tendrils densely clothed with soft woolly hairs, when young these and all other parts merely pubescent. Leaves 2–4 in. long and broad, broadly ovate-cordate or nearly rounded, 3–5-angled or -lobed, minutely toothed, pubescent above, beneath when old densely clothed with pale brown woolly matted hairs; petiole stout, 1 in. long. Tendrils stout. Male fl.: Shortly peduncled, solitary or few. Calyx hispid; lobes short, pinnatifid. Corolla $\frac{3}{4}$ in. diameter, apparently 5-lobed to below the middle. Female fl.: Peduncle with sometimes a foliaceous orbicular toothed bract at the base. Ovary globose, hispid. Calyx-tube above the ovary campanulate, hispid. Corolla campanulate, 5-lobed to the middle. Fruit (immature) almost globose, densely clothed with rufous articulate shining bristles; peduncle 1–2 in. Seeds very broadly obovoid.

Lower Guinea. Angola, dense forests, Sierra de Alta and Sobati de Mussengua, *Dr. Welwitsch!*

Dr. Welwitsch observes that the plant varies much in pubescence, but little in the foliage; I find the calyx-lobes to vary in amount of incision.

23. **STAPHYLOSYCE,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 828.

Monœcious? Flowers shortly spiked. Male: Calyx turbinate; lobes 5, short, recurved, remote. Corolla 5-lobed to the middle, lobes

obtuse. Filaments 3, connate? anthers connate into a globose head, cells conduplicate. Female fl.: Staminodes 3, large, sessile, globose. Ovary ovoid, glabrous; style columnar; stigmas 3, large, obcordate, 2-lobed; ovules numerous on 3 placentas. Fruit globose, fleshy. Seeds many, ovate, compressed, smooth, margins obtuse; testa coriaceous.—A glabrous, climbing, slender African shrub. Leaves young ovate, adult palmately 5-lobed, membranous. Tendrils 2–3-fid, stout. Flowers in short, strict, stout, axillary spikes, small or middling-sized, yellow.

I suspect that this genus will merge into *Physedra;* the specimens are very imperfect, and owing to their texture and colour difficult of analysis.

1. **S. Barteri,** *Hook. f. l.c.* Climbing, 15–20 ft. Stem terete. Leaves variable, short-petioled, dark green or brown when dry, upper entire, coarsely sinuate-toothed, 4 in. long, lower broader, palmately 3–5-lobed, deeply cordate at the base, lobes oblong, upper surface of the old leaves densely covered with white papillæ. Spikes many-flowered, stout, 1 in. long, strict, puberulous, with short fleshy? persistent, glandular bracteoles at the base of the very short racemed pedicels. Flowers about $\frac{1}{2}$ in. diameter. Fruit 3–4 in. diameter, fleshy. Seeds $\frac{1}{5}$ in. long.

Upper Guinea. Fernando Po and Nupe on the Niger, *Barter!*

24. **CUCURBITA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 828.

Monœcious. Flowers all solitary. Male: Calyx-tube campanulate, lobes simple or foliaceous. Corolla campanulate, 5-lobed to or below the middle; lobes recurved at the apex. Filaments 3, free, inserted at the base of the calyx; anthers connate, one 1-celled, two 2-celled, cells elongate, conduplicate. Rudiment of ovary 0. Female fl.: Staminodes 3. Ovary oblong; style short, stigmas 3, 2-lobed; ovules numerous, on 3 placentas. Fruit fleshy. Seeds many, ovate or oblong, flattened, margined or not.—Annual or perennial-rooted tropical herbs; branches usually prostrate and rooting. Leaves lobed, cordate at the base. Tendrils 2-multifid. Flowers large, yellow. Fruit large.

The gourds and pumpkins are commonly cultivated, and very variable and difficult to distinguish by dry specimens. I have adopted here Naudin's characters, which were carefully drawn from a multitude of cultivated specimens of all the forms of each species.

Leaves not deeply lobed; petioles scarcely prickly; calyx-lobes subulate	1. *C. maxima.*
Leaves deeply lobed; petioles prickly; calyx-lobes subulate	2. *C. Pepo.*
Leaves more or less lobed; petioles scarcely prickly; calyx-lobes foliaceous	3. *C. moschata.*

1. **C. maxima,** *Duchesne; Naud. in Ann. Sc. Nat. sér.* 4, vi. 17. Annual. Stems subterete. Leaves large, reniform, 5-lobed, lobes rounded, sinus shallow or 0; hairs of petiole equal, rough, not pungent. Flowering peduncles terete. Calyx-tube obconic, not contracted under the campanulate corolla; teeth linear filiform or undeveloped.

Fruiting peduncle stout, corky, striate, not grooved. Fruit with scarcely fibrous pulp. Seeds white.—A. Rich. Fl. Abyss. i. 295.

Upper Guinea. Nupe on the Niger, apparently indigenous, *Barter!*
Nile Land. *Grant.* Abyssinia, &c., cultivated, *Schweinfurth!*
Lower Guinea. Angola, &c., *Dr. Welwitsch.*
This, the common gourd, is no doubt cultivated throughout Africa, under various forms.

2. **C. Pepo,** *DC.; Naudin. l.c.* 29. Annual. Stem creeping, rarely erect, angular and grooved. Leaves 5-lobed, with a deep basal sinus, lobes acute, often lobulate; petioles and nerves beneath prickly. Peduncles obtusely 5-angled. Calyx of male fl. campanulate, constricted beneath the corolla, teeth subulate. Fruiting peduncle often woody, angled and deeply grooved. Fruit with fibrous flesh. Seeds white.

Nile Land. Cultivated in Abyssinia, *Schweinfurth!*
Lower Guinea. Angola, *Dr. Welwitsch!*
The Pumpkin, cultivated in all hot countries.

3. **C. moschata,** *Duchesne; Naud. l.c.* 47. Annual. Stem creeping, subterete. Leaves soft, velvety, deep green often marbled with white, reniform, toothed, 5–7-lobed, lobes and sinus acute or rounded, petiole and nerves beneath never prickly. Peduncle of male fl. hirsute, subterete. Calyx-tube very short or 0; lobes linear, flat, often foliaceous. Female fl.: Peduncles 5-angled. Fruit glaucous, pulverulent; pulp scarcely fibrous. Seeds white.

Nile Land. Abyssinia, cultivated, *Schweinfurth!*
I have seen no African specimens; but cannot doubt that so common a plant occurs abundantly cultivated.
I find seeds of the black-seeded gourd (*C. melanosperma*, Braun, Naud. l. c. 53), in Dr. Welwitsch's collection, from specimens recently introduced at Mossamedes.

25. **BRYONOPSIS,** Arn. in Hook. Journ. Bot. iii. 274.

Flowers monœcious. Male: Solitary or fascicled on capillary pedicels. Calyx-tube campanulate, lobes 5, subulate. Corolla campanulate, 5-fid. Filaments 3, short, free, inserted within the calyx-tube; anthers cohering, one 1-celled, two 2-celled; cells flexuous round the broad connective which is not produced at the apex. Rudiment of ovary 0. Female fl.: Shortly peduncled, few or solitary in the same axil with the male. Calyx-limb contracted at the base. Staminodes 5, linear. Ovary ovoid; style slender, not inserted in a disk, 3-fid; stigmas broad-obcordate; ovules numerous, on 3 placentas. Berry globose, soft. Seeds many, subpyriform, very turgid, surrounded by a very thick raised grooved crenulate ring on each side of which the tumid faces of the seed project; testa hard.—A perennial-rooted subglabrous slender scandent herb. Leaves 5–7-lobed, cordate at the base. Tendrils 2-fid. Flowers small, yellow. Fruit small.

1. **B. laciniosa,** *Arnott, l.c.* Glabrous or slightly hairy. Stems much branched and leafy. Leaves very membranous, 5–7 in. broad,

pedately lobed, slightly scabrid or papillose, basal sinus rounded; lobes oblong-lanceolate, distantly sinuate-serrate; petiole slender. Female fl.: Solitary few or many, pedicels very variable. Calyx-lobes subulate. Corolla ¼ in. diameter. Ovary glabrous. Fruit ½–1 in. diameter, green striped with yellow. Seed ¼ in. long.—*Bryonia luciniosa*, L.; Wight, Ic. t. 500. *B. tenuis*, Klotzsch in Peters' Mossamb. Bot. 150.

Upper Guinea. St. Thomas Island, alt. 2000 ft., *Mann!* A form with fruit 1¼ in. diameter.

Nile Land. Unyoro, *Grant!*

Mozamb. Distr. Querimba, *Peters!* Rovuma bay, *Dr. Kirk!*

A very variable plant, a native of India, Australia, and some of the Pacific Isles.

26. **DACTYLIANDRA,** Hook. f. in Gen. Plant. i. 829 (under Bryonia).

Flowers monœcious. Male: Subumbellate. Calyx-tube campanulate; lobes 5, subulate. Corolla shortly campanulate, 5-lobed to below the middle, pubescent. Stamens 5, filaments free, inserted within the calyx-tube; anthers cohering, one 1-celled, two 2-celled, cells hippocrepiform; connective not produced at the apex. Rudiment of ovary a depressed gland. Female fl.: Solitary in different axils from the males. Staminodes 0. Ovary oblong; style columnar, inserted in a disk; stigma subcapitate, 3-lobed; ovules many, on 3 placentas. Fruit globose. Seeds few or many, irregularly oblong, ends truncate, one side pointed, surfaces flattish, border sinuate, grooved and uneven; testa very thick.—A scabrid, much branched, slender herb. Leaves digitately 5–7-lobed, with a stipuliform bract at the base of the petiole. Tendrils simple. Flowers yellowish and fruit small.

1. **D. Welwitschii,** *Hook. f.* Stem angled, grooved and scabrid, trailing and climbing. Leaves 2–4 in. diameter, rather membranous, but very scabrid, lobes obovate or lanceolate, contracted at the base, irregularly sinuate-lobed serrate or toothed; petiole 1–3 in., rather stout. Stipular bract orbicular-reniform or dimidiate, ⅕–½ in. diameter, strongly ciliate-toothed. Female fl.: ⅛–⅙ in. diameter, numerous, subumbelled on slender scabrid peduncles; pedicels unequal, ¼–⅓ in. Berry scarlet (*Welwitsch*), ⅔ in. diameter. Seeds ⅕ in. long, dark coloured.

Lower Guinea. Sandy thickets in Loanda, *Dr. Welwitsch!*

A very curious plant, resembling some *Trochomerias* and *Ctenolepis* in habit and the stipuliform bracts.

27. **CTENOLEPIS,** Hook. f.; Benth. et Hook. f. Gen. Plant. i. 832.

Flowers monœcious. Male: Racemose on slender pedicels. Calyx-tube short; lobes 5, small. Corolla rotate, 5-partite. Filaments 3, free, remote, very short; anthers small, one 1-celled, two 2-celled, cells short, straight, connective not produced. Rudiment of ovary 0. Female fl.: Solitary in the same axil as the male, shortly peduncled.

Staminodes 0. Ovary ovoid; style columnar, without a basal disk, stigmas 2–3; ovules few, on 2–3 placentas. Fruit rather fleshy, small, subglobose or obliquely quadrate. Seeds few or many, ovoid, much compressed or boat-shaped, margins obtuse or acute; testa smooth. —Prostrate, rarely climbing, annual, scabrid, tropical and subtropical Asiatic and African herbs. Leaves digitately 5–7-lobed or -partite. Tendrils undivided. Bracts stipuliform in the axils of the leaves, toothed or pectinate. Flowers minute.

1. **C. cerasiformis,** *Hook. f.; Naud. in Ann. Sc. Nat. sér.* 5, vi. 13. Stem extensively climbing, much branched, very slender, grooved and angled, slightly scabrid. Leaves 3–4 in. broad, membranous, scabrid on both surfaces, lobes 3, rarely 5, lanceolate, very narrow at the base, sinuate-toothed, the middle are often 3-lobed, teeth apiculate; petioles stout, scabrid. Stipuliform bracts orbicular reniform or dimidiate, $\frac{1}{4}$–$\frac{1}{2}$ in. long, cilia as long as the bract is broad. Male fl.: Peduncle 2 in. long, flowers very minute, in a short crowded raceme, pedicels short, slender, spreading. Berry sessile, $\frac{1}{2}$ in. diameter, 2-seeded, red. Seeds $\frac{1}{3}$ in. long, oblong-ovate, very concave above and convex below, edge sharp; testa smooth, dark brown.—*Zehneria cerasiformis,* Stocks in Hook. Kew Journ. Bot. iv. 149. *Bryonia fimbristipula,* Fenzl in Kotschy Pl. Nub. No. 205.

Nile Land. Nubia, *Kotschy!* Gallabat, *Schweinfurth!*
Mozamb. Distr. Between Tette and the coast, *Dr. Kirk!*
Also a native of Sind and Guzerat.

28. **ZEHNERIA,** Endl.; Benth. et Hook. f. Gen. Plant. i. 830.

Flowers usually diœcious, all fascicled racemose or cymose. Male fl.: Calyx tubular or campanulate, 5-toothed or -lobed. Corolla rotate, 5-partite, villous within. Filaments 3, rarely 4–5, inserted in the tube or base of the calyx, stout or slender, often villous; anthers orbicular, one 1-celled, two 2-celled or all 1-celled, hairy at the back and sides, cells curved, connective not produced. Rudiment of ovary 3-lobed. Female fl.: Staminodes 3, linear. Ovary ovoid or subglobose; style inserted on a thick annular disk; stigma 3-lobed or stigmas 3; ovules numerous, on 3 placentas. Berry usually globose. Seeds few or many, obovate, flattened or tumid, usually smooth and margined, rarely tubercled.—Slender glabrous scabrid or tomentose scandent or prostrate tropical perennial-rooted herbs. Leaves angled or toothed, often membranous. Tendrils simple. Flowers small, white or yellow. Fruit shortly peduncled, small. The stems and branches, which are invariably angled and grooved when dry, are possibly terete when fresh.

Male flowers fascicled in the axils of the leaves.

Leaves scaberulous above, glabrous beneath. Seeds $\frac{1}{8}$ in. long, broadly obovate, border thickened	1. *Z. angolensis.*
Leaves scabrid or pubescent. Seeds lenticular, $\frac{1}{6}$ in. long, border slightly thickened	2. *Z. scrobiculata.*

Leaves almost glabrous. Seeds lenticular, $\frac{1}{12}$ in. long, border faintly thickened	3.? *Z. microsperma.*
Leaves with white wool beneath	4. *Z. velutina.*
Male flowers capitate panicled corymbose or racemose on a long peduncle.	
Leaves very pubescent beneath. Calyx-tube short	5. *Z. scabra?*
Leaves glabrous. Flowers very minute	6. *Z. micrantha.*
Leaves scabrid, deltoid, petiole slender	7. *Z. deltoid a.*
Leaves scabrid, much lobed, almost sessile	8. *Z. racemosa.*

1. **Z. angolensis,** *Hook. f.* Monœcious or dicecious; glabrous. Stems slender. Leaves 2–3½ in. broad, membranous, pale green, minutely papillose and scaberulous above, angularly 3-lobed sometimes to near the base, quite entire or obscurely sinuate-toothed, basal sinus acute narrow; terminal lobe longest, triangular ovate or lanceolate, acute or acuminate, mucronate, lateral with angular deflexed basal lobules; petiole shorter than the blade. Male fl.: Fascicled, very shortly pedicelled. Calyx-tube very short, glabrous. Corolla 1–12th in. diameter. Stamens all 2-celled. Female fl.: White, fascicled or solitary with the males, shortly pedicelled. Ovary minute. Berry ⅔ in. diameter, globose, minutely reticulate. Seeds flat, broadly ovate, ⅙ in. long.

Lower Guinea. Angola, thickets in Golungo Alto, *Dr. Welwitsch!*

2. **Z. scrobiculata,** *Hochst. in Schimp. Pl. Abyss.; A. Rich. Fl. Abyss.* i. 287. Monœcious. Stem glabrous or with spreading hairs, tips and petioles often tomentose. Leaves ovate-cordate, 2–3 in. long, green, basal sinus broad, open, scabrid above, pilose or subtomentose beneath, obtuse, apiculate, entire or slightly 3-lobed, acutely coarsely toothed; petiole shorter than the blade. Male fl.: Very numerous, fascicled, peduncles ⅛–¼ in. long. Calyx narrow-campanulate, ⅛ in. long. Female fl.: Fascicled. Ovary ovoid. Berry globose, ⅓ in. diameter, smooth or pitted on the surface. Seeds ⅙ in. long, lenticular, border faintly thickened.—*Z. longepedunculata*, Hochst. ex Herb. Franqueville. *Bryonia scrobiculata*, Hochst. Pl. Schimp. 164 & 927.

Upper Guinea. Fernando Po, alt. 3000 ft., *Mann!* A form with more deeply lobed leaves.

Nile Land. Abyssinia, *Dillon! Schimper! Plowden, Schweinfurth!* 841 (and 838, a more glabrous form).

Dr. Welwitsch's 862, without flower or fruit, may be a perfectly glabrous form of this, or *Z. lucida* (*Pilogyne*, Naud).

3. **Z? microsperma,** *Hook. f.* Branches very slender, glabrous. Leaves 1½–2 in. long, membranous, black when dry, ovate-cordate, obtuse or subacute, apiculate, basal sinus broad, open, acutely toothed, scaberulous above with minute white dots, glabrous beneath; petioles slender, shorter than the blade. Male fl.: Not seen; female apparently very minute. Fruit solitary or two together, on short filiform peduncles, globose, ½ in. diameter, surface obscurely reticulate. Seeds very minute for the Order, lenticular, hardly $\frac{1}{12}$ in. long, faintly bordered.

Mozamb. Distr. Chibira, about lat. S. 16°, long. E. 35°, *Dr. Meller!*

A pretty little species, apparently closely allied to *Z. scrobiculata*, but with very minute seeds. Owing to the absence of male flowers its position in the genus is uncertain.

4. **Z. velutina,** *Endl. in Walp. Rep.* ii. 196. Stem rather stout, pubescent, angled, grooved. Leaves 2–3 in. long, rather coriaceous, ovate-cordate, acuminate, apiculate, acutely toothed, basal sinus rounded, contracted, scabrid above, tomentose below as well as the petioles with soft white woolly pubescence. Male fl.: Crowded, fascicled; peduncles short. Calyx-tube cylindric, $\frac{1}{4}$ in. long, tomentose. Fruit unknown.—A. Rich. Fl. Abyss. i. 287.

Nile Land. Abyssinia, *Schimper!* No. 1242 (1863–68.)

A very distinct species from the tomentose under-surface of the leaves, and large flowers.

5. **Z. scabra,** *Sond? Fl. Cap.* ii. 486. Stem angular, slender, slightly pubescent. Leaves 2 in. long, ovate-cordate, entire or obscurely 3-lobed, acutely toothed, scabrid and papillose above, grey and tomentose beneath with soft appressed pubescence; petioles short, tomentose. Male fl.: Subcapitate on a slender peduncle $\frac{3}{4}$ in., shortly campanulate. *? Z. longepedunculata,* Hochst., A. Rich. Fl. Abyss. i. 287.

Nile Land. Abyssinia, *Roth!*

This so closely resembles the Cape *Z. scabra*, that I cannot venture to separate it, and till flower and fruit are known it must remain doubtful. There are two forms of the Cape plant, one with the female flower and fruit fascicled in the leaf-axils, the other with them umbelled at the apex of a long pedicel like the male; in both the seeds are obovoid, rather tumid, without a border.

6. **Z. micrantha,** *Hook. f.* Stem very slender, glabrous, deeply grooved, angles green. Leaves membranous, green, $2\frac{1}{2}$–3 in. long, broadly ovate-cordate, angularly 3-lobed; teeth short, distant, middle lobe long acuminate, lateral short, acute, auricles rounded, basal sinus acute above, slightly scabrid with scattered short white hairs, glabrous beneath; petioles very slender, almost as long as the leaf or shorter. Male fl.: Very minute, 1–12th in. diameter, subcorymbose, on slender pedicels; peduncles slender, solitary, 1- or few-flowered, shorter than the petioles. Calyx-tube very shortly campanulate, almost glabrous within. Anthers all 2-celled, cells nearly straight, connective glabrous at the back, cells ciliate. Female fl. and fruit unknown.

Upper Guinea. Camaroons mountain, alt. 7000 ft., *Mann!*

7. **Z. deltoidea,** *Hook. f.* Stems slender, glabrous or slightly hairy, grooved with green angles. Leaves 2 in. long, brown when dry, deltoid-ovate, truncate and horizontal at the base, acuminate, deeply coarsely toothed, the basal teeth on each side almost forming horizontal lobes, scabrid with white papillæ above, smoother with few scabrid minute hairs below; petiole slender, shorter than the leaf. Male fl.: Numerous, umbellate on solitary or geminate peduncles 1–$1\frac{1}{2}$ in. Calyx pubescent, tubular-campanulate, $\frac{1}{6}$ in. long. Anthers all 2-celled. Female fl. and fruit unknown.

Upper Guinea. Camaroons mountains, alt. 4500 ft., *Mann!*

8. **Z. racemosa,** *Hook. f.* Dicœcious, prostrate. Root elongate, woody, perennial. Stems rather strong, angular, smooth or slightly scabrid. Leaves very variable, coriaceous, yellow-green when dry, very shortly petioled, very scabrid on both surfaces, deltoid or trapezoid ovate or reniform, with 3–7 very spreading irregular lobes, entire or sharply toothed, acute or acuminate, or angled with broad or narrow ovate-oblong deltoid or linear lobes, which sometimes reach to the base, basal sinus very open; nerves prominent reticulate beneath; petioles scabrid, $\frac{1}{8}$–$\frac{1}{4}$ in. Male fl.: Small, very numerous, interruptedly racemose on stiff scabrid axillary peduncles $\frac{1}{2}$–$1\frac{1}{2}$ in.; peduncles fascicled or whorled, rigid. Calyx very shortly campanulate, pubescent. Corolla $\frac{1}{8}$ in. diameter. Anthers all 2-celled. Female fl.: Solitary or fascicled, shortly pedicelled. Ovary ovoid, rostrate, hispid. Calyx nearly glabrous inside. Fruit $\frac{1}{2}$ in. diameter, globose, smooth. Seeds few, broadly ovoid, tumid, white, border not thickened.

Lower Guinea. Angola, stony hills at Lapolla, &c. in Huilla, *Dr. Welwitsch!*

Z. Peneyana, Naud. *fide* Ascherson in Schweinfurth, Flora Æthiop. 268 (name only). I know nothing of this, and do not find the name elsewhere.

There is still another undescribed *Zehneria* from Tropical Africa, found by Mann at 3000 feet elevation on Fernando Po; it has rather small palmately-lobed leaves, pubescent beneath, and very numerous fascicled axillary female flowers.

29. MUKIA, Arn.; Benth. et Hook. f. Gen. Plant. i. 829.

Monœcious. Male fl.: Fascicled. Calyx campanulate, 5-toothed. Corolla rotate, 5-partite, segments acute. Filaments 3, free, short, inserted in the calyx-tube; anthers oblong, one 1-celled, two 2-celled, cells linear straight, connective produced at the apex. Rudiment of ovary gland-like. Female fl.: Subsessile, solitary or aggregate. Staminodes 0 or minute. Ovary ovoid, hispid; style clavate, inserted in an annular disk; stigma large, 2–3-lobed; ovules few on 2 to 3 placentas. Berry globose. Seeds few, thick, oblong, compressed with flat scrobiculate surfaces and raised grooved scarcely thickened margins.—An annual scabrid, prostrate or scandent, tropical Old World herb. Leaves oblong-cordate, 3–7-angled, obtuse. Tendrils simple. Flowers small, yellow.

1. **M. scabrella,** *Arn.; Naud. in Ann. Sc. Nat. sér.* 4, xii. 141. Stem much branched, angled, grooved, and petioles and peduncles hispid and scabrid with small white prickles. Leaves pale green or hoary, rather coriaceous, 1–3 in. long, cordate or oblong or deltoid-cordate, entire or 3–7-lobed, obtusely sinuate-soothed, scabrid on both surfaces and hispid below. Male fl.: Peduncles short, fascicled, $\frac{1}{8}$ in. diameter. Female fl: In different axils, as small. Ovary very hispid. Fruit $\frac{1}{2}$ in. diameter, red or yellowish. Seeds $\frac{1}{6}$ in. long, pale yellow.—Wight, Ic t. 501. *M. madraspatana,* Ascherson in Schweinfurth, Fl. Æthiop. 268; *Bryonia micrantha,* Hochst. Hb. Schimp. Abyss., et *B. obtusa,* A. Rich. Fl. Abyss. i. 288, 289.

Upper Guinea. Gambia, *Ingram!* Niger river, *Barter!*

Lower Guinea. Angola, *Dr. Welwitsch!*
Nile Land. Abyssinia, *Schimper! Dillon! Schweinfurth!* Nile banks, *Grant!*
Mozamb. Distr. Shire, &c., *Dr. Kirk!*
The only species of the genus found in Natal, and an abundant Indian plant.

30. **MELOTHRIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 830.

Flowers generally monœcious. Male: Racemose or cymose, jointed on the peduncle. Calyx campanulate, 5-toothed. Corolla 5-partite. Filaments 3, rarely 5, short, free, inserted within the calyx-tube; anthers free or slightly cohering, entire or 2-partite, one 1-celled, two 2-celled, rarely all 2-celled, cells straight, connective usually produced, simple or 2-fid. Rudiment of ovary globose or annular. Female fl.: Solitary, usually on a long capillary peduncle. Staminodes 3, sometimes antheriferous. Ovary ovoid globose or fusiform, acute or obtuse; style short, inserted in an annular disk; stigmas 3, linear, dilated or capitate, 2-lobed; ovules many on 3 placentas. Berry small, on a capillary peduncle, ovoid fusiform or beaked. Seeds many, rarely few, flattened; testa coriaceous.—Usually slender prostrate or climbing tropical herbs. Leaves entire lobed or palmatisect. Tendrils simple, capillary. Flowers small, white or yellow.

Stem in all the African species very slender, deeply grooved, with green ribs.

Leaves deltoid or 3-lobed. Berry narrow fusiform	1. *M. tridactyla.*
Leaves deltoid, with acute angles. Berry globose	2. *M. triangularis.*
Leaves deltoid, with obtuse angles. Berry globose	3. *M. deltoidea.*
Leaves cordate. Berry globose	4. *M. cordifolia.*

1. **M. tridactyla,** *Hook. f.* Glaucous. Stems and branches smooth or scabrid, ultimate capillary. Leaves $1\frac{1}{2}$–4 in. broad, green, triangular in outline, 3-lobed; lobes narrow or broad, the lateral placed at right angles with the middle one which is the longest, all obtuse or acute, apiculate, almost quite entire, scabrid above, glabrous or scabrid on the nerves beneath; petioles short or long, sometimes hispid. Male fl.: Peduncles capillary. Calyx shortly campanulate. Corolla $\frac{1}{8}$ in. diameter, yellow. Filaments very short; anthers oblong, all 2-celled, cells parallel, ciliate; connective produced. Female fl.: Peduncles $\frac{3}{4}$–2 in. Ovary very slender, long-beaked. Style slender. Fruit fusiform, $\frac{3}{4}$–1 in. long, beaked at both ends. Seeds lenticular, $\frac{1}{10}$ in. long, pale brown.—*M. Thwaitesii,* Schweinf. Reliq. Kotschy. 44, t. 29, excl. syn. and description of fruit.

Lower Guinea. Angola, shady places, Golungo Alto, *Dr. Welwitsch!* Congo, *Burton!*
Mozamb. Distr. Shupanga, *Dr. Kirk!*
Capillary, leafless, axillary branches often bear both male and female flowers, and resemble peduncles. The young leaves are triangular, as in *M. triangularis,* but not toothed as in that plant. Also found in Johanna Island.
Schweinfurth refers this to *M. deltoidea,* Thw., of Ceylon (not Benth.), from which it differs widely in the ripe fruit.

2. **M. triangularis,** *Benth. Fl. Nigrit.* 367. Stems and branches capillary, glabrous ciliate or scabrid. Leaves membranous, 1–3 in.

diameter, exactly triangular with a very broad shallow sinus, lobes all acute or subacute, toothed or sinuate-toothed, scabrid or minutely papillose above, ciliate on the nerves beneath and on the petiole. Male fl.: Peduncle 1-flowered very slender, solitary or with a female in the same axil. Calyx campanulate. Corolla short, 1-10th in. diameter. Anthers with broad membranous connectives, cells diverging upwards, ciliate. Female fl.: Peduncle 1–3 in. Ovary ovoid; style slender. Calyx and corolla as in the male. Fruit globose, $\frac{1}{3}$ in. diameter. Seeds lenticular, flat, 1-10th in. long, border evident, thickened.—*Bryonia capillacea*, Schum. and Thonn. Pl. Guin. 430.

Upper Guinea. Fernando Po, and Aboh, *Vogel! Mann! Barter!* Brass, on the sea-shore, *Barter!*

Nile Land. Near B. Gazal on the White Nile, *C. M. Brownell!* (*Petherick.*)

Lower Guinea. Golungo Alto, borders of thickets, *Dr. Welwitsch!*

Leaves large, very membranous, almost quite entire and not scabrid.

3. **M. deltoidea,** *Benth. in Flora Nigrit.* 368. Very similar to *M. triangularis*, but much stouter; leaves not scabrid, their outer angles more rounded; peduncles shorter and ovary fusiform. Berry ovoid, narrowed at both ends.—*Bryonia deltoidea*, Schum. and Thonn. Pl. Guin. 429?

Upper Guinea. Aboh, *Vogel!*

A doubtful plant, of which none of my specimens are very good; the ovary is fusiform, but the fruit globose, as in *M. triangularis*.

4. **M. cordifolia,** *Hook. f.* Stem slender, glabrous, smooth. Leaves membranous, $1\frac{1}{2}$–2 in. diameter, very broadly cordate or triangular-cordate, obtuse, apiculate, minutely distantly toothed, lobes rounded, basal sinus broad and open, minutely scabrid above, glabrous beneath; petiole short, slender. Male fl.: Peduncle capillary, $\frac{1}{2}$ in. Calyx, corolla and stamens as in *M. tridactyla*. Female fl.: Peduncles 1 or 2, usually in the same axils as the male. Ovary fusiform, rostrate; style slender. Calyx and corolla a little smaller than the male. Berry small, $\frac{1}{4}$ in. diameter. Seeds few, lenticular, flat, $\frac{1}{6}$ in. long, slightly bordered.

Upper Guinea. Gaboon river, *Mann!*

31. RHYNCHOCARPA, Schrader; Benth. et Hook. f.

Gen. Plant. i. 831.

Flowers monœcious or diœcious. Male fl.: Racemose or corymbose. Calyx-tube campanulate, shortly 5-lobed. Corolla rotate, 5-partite. Filaments 3 rarely 5, free, short, glabrous, inserted in the calyx-tube; anthers short, glabrous, one 1-celled, two 2-celled, (or 5 all 1-celled), free or cohering, cells curved, connective produced into a simple or 2-fid appendage. Rudiment of ovary 0 or small. Female fl.: Solitary or fascicled, shortly peduncled. Staminodes 0 or 3, small. Ovary ovoid, beaked. Style without a disk or a small one at its base. Stigmas 2 or 3, broad or narrow; ovules few or many, on 2 or 3 placentas. Berry ovoid, usually beaked, indehiscent. Seeds few or many, margined or not, testa usually crustaceous and

smooth.—Climbing or prostrate, glabrous hairy or scabrid perennial-rooted tropical Asiatic and African herbs. Leaves entire lobed or partite. Tendrils simple. Flowers small or minute. Fruit fleshy, small.

Leaves cordate, pubescent.	Fruit long-beaked	1. *R. fœtida.*
Leaves digitately multifid.	Fruit ovoid, apiculate	2. *R. Bainesii.*
Leaves digitately multifid.	Fruit long-beaked	3. *R. angolensis.*

1. **R. fœtida,** *Schrad.; Naud. in Ann. Sc. Nat. sér.* 4, xii. 146. Perennial-rooted, softly glandular or scaberulous-pubescent, fœtid. Stem stout, hairy. Leaves shortly petioled, broadly ovate-cordate, 1–3 in. long, obtuse, crenate-toothed, sinus and auricles rounded. Male fl.: Minute, in small axillary racemes. Calyx urceolate, hairy, lobes subulate. Corolla short. Anthers smooth, connectives produced into a long acute appendage. Female fl.: Very shortly peduncled. Staminodes subulate. Ovary ovoid; stigmas 2, recurved. Fruit subsessile, $\frac{2}{3}$ in. long, subglobose, suddenly contracted into a long beak, red, pubescent, 2-celled, about 4-seeded. Seed broadly obovoid, compressed, $\frac{1}{6}$ in. long, turgid, black, with a broad thin wing.—*R. fœtidissima,* Walp. Rep. ii. 197; *Bryonia Perrottetiana,* Seringe in DC. Prod. iii. 304; *B. fœtidissima,* Schum. and Thonn. Pl. Guin.; *Melothria fœtida,* Lamk. Dict. iv. 87; *Trichosanthes fœtidissima,* Jacq. Collect. ii. 341; Ic. Rar. t. 624; *Cyrtonema convolvulacea,* Fenzl, and *C. divergens,* Hochst., A. Rich. Fl. Abyss. i. 286; *C. fœtens,* Hochst. in Schimp. Hb. Abyss. No. 2174.

Upper Guinea. *Schumacher.*
Nile Land. Nubia at Kordofan, *Kotschy!* Abyssinia, *Schimper!*
Lower Guinea. Loanda, *Dr. Welwitsch!*
South Central. Koobie to N. Shaw valley, *Chapman and Baines!*
Mozamb. Distr. Lupata, *Dr. Kirk!*
Also a native of Western India, the Madras Peninsula, and Natal.
Anther-appendages sometimes 2-fid.

2. **R. Bainesii,** *Hook. f.* Stem stout, smooth. Leaves $1\frac{1}{2}$ in. diameter, coriaceous, deeply palmately 3–5-lobed, densely hispidly pubescent or scabrid on both surfaces with very closely set short hairs; lobes linear or broader, irregularly lobed and toothed; petiole stout, shorter than the blade. Flowers unknown. Fruit $\frac{1}{2}$ in. long, 2–3 together, sessile, broadly ovoid obtuse apiculate, 6–8-seeded. Seeds grey, $\frac{1}{6}$ in. long, obovoid, rather turgid, surfaces almost flat, truncate, sides thick flat with 2 grooves and 3 keels.

South Central. Koobie to N. Shaw valley, *Chapman and Baines!*
A very distinct species, in foliage, fruit, and seed, from any S. African, to several of which it is allied.
The specimen is wretched, but the pubescence of the leaf affords a good character.

R. africana, Ascherson in Schweinf. Fl. Æthiop., 268; name only; unknown to me.
R. Courbonii, Naud. in Ann. Sc. Nat. sér. 4, xviii. 197, is probably a *Corallocarpus:* see *C. etbaicus.*
R. Schimperi, Naud. l.c. xvi. 180, Abyssinia, Schimper, No. 413, may be *C. Ehrenbergii.*
R. hirtella, Naud, l.c. 181 (*Cyrtonema hirtellum,* Hochst. in Herb. Schimp. Abyssinia, 1852, N. 330), is also unknown to me, as is *R. pedunculosa,* Naud. l.c. 182, Herb. Schimp. Abyss. 1853, No. 1198: both are probably species of *Corallocarpus.*

There are fragments of two more Tropical African *Rhynchocarpas* in the Herbarium, both from South Central Africa, collected by Baines; one, found with *R. Bainesii*, resembles *R. dissecta*, has no flower or fruit; the other (without exact locality) has divided very scabrid leaves with narow segments and recurved margins; the fruit is peduncled, $\frac{3}{4}$ in long elliptic-ovoid and rostrate; seeds very large, $\frac{1}{3}$ in. long, tumid, elliptic-oblong, white, smooth, with rounded, not thickened margins.

32. **CORALLOCARPUS**, Welw.; Benth. et Hook. f. Gen. Plant. i. 831.

Flowers minute, monœcious. Male: Crowded at the end of a long peduncle. Calyx broadly campanulate, 5-lobed. Corolla 5-partite. Filaments 3, very short, free, inserted in the calyx-tube; anthers entire or 2-partite, one 1-celled, two 2-celled, cells straight; connective often 2-fid, usually dilated or produced at the apex. Rudiment of ovary 0 or small. Female fl.: Sessile or shortly pedicelled, solitary or fascicled. Staminodes 0 or minute. Ovary ovoid, usually beaked; style not seated in a disk, stigmas 2–3; ovules few on 2–3 placentas. Berry ovoid, obtuse or beaked, dehiscing transversely near the base. Seeds few, obovoid, tumid.—Prostrate scabrid or subtomentose N. W. Indian and tropical African herbs. Stems stout. Leaves lobed or palmate, thick, coriaceous or fleshy. Tendrils simple. Flowers small, greenish yellow. Fruit fleshy, scarlet.

A genus with difficulty distinguished from *Rhynchocarpa*, except by habit and the opercular dehiscence of the fruit. The leaves are excessively variable in all, fleshy and difficult to preserve. Little dependence can be placed on their characters as given below. The form of the fruit depends much on the number of seeds, which is very variable; these latter, however, appear to afford the best specific characters.

Seed obovoid or pyriform, compressed at the base.
- Leaves scabrid. Fruit ovoid, long-beaked . . . . . 1. *C. Fenzlii.*
- Leaves papillose. Fruit ovoid, short-beaked . . . . . 2. *C. Gijef.*
- Leaves pubescent. Fruit oblong, not beaked . . . . . 3. *C. Welwitschii.*

Seed globose or nearly so, not compressed at the base. (Leaves tomentose in all.)
- * Leaves deeply 3–5-lobed.
  - Beak of fruit slender. Seed very small, quite even . . . . 4. *C. Ehrenbergii.*
  - Fruit not beaked. Seed transversely plicate, rugose . . . . 5. *C. Schimperi.*
  - Beak of fruit short. Seed smooth . . . . . 6. *C. etbaicus.*
- ** Leaves 5-angled.
  - Fruit not or hardly beaked . . . . . 7. *C. crostris.*

1. **C. Fenzlii,** *Hook. f.* Stem very stout, glabrous. Leaves 3–4 in. diameter, orbicular in outline, palmately 3–5-lobed; lobes large, broad, obtuse, apiculate, entire or again lobed, more or less scabrid on both surfaces, sinus rounded, those between the lobes obtuse or acute. Flowers not seen. Fruit $\frac{3}{4}$ in. long, nearly sessile, ovoid, narrowed into a slender beak for $\frac{1}{2}$ or $\frac{2}{3}$ its length. Seeds $\frac{1}{6}$ in. long, dirty grey-brown, ovoid, turgid, broadly truncate at the compressed base, margins rounded, girt with a smooth slender elevated border; testa uneven, slightly ruminate.—*Rhynchocarpa corallina*, Naud. in Ann. Sc. Nat. sér. 4, xvi. 180. *Coniandra corallina*, Fenzl in Kotschy, Hb. Nub. No.162.

Nile Land. Rocky mountains of Kordofan, *Kotschy!*

The specimens in Kotschy's 1837–38 collection have much more scabrid leaves than those of 1839; but the fruit and seeds are identical. The Guzerat *Æchmandra conocarpa*, Dalz. Bombay Fl. 100, is perhaps the same plant, but has smaller fruit.

2. **C. Gijef,** *Hook. f.*; (*Rhynchocarpa*) *Schweinf. Herb. Nub. No.* 60. Stem elongate and branches woody, twisted, ½ in. thick, much branched; bark thick, corky, yellow-white, grooved, smooth. Leaves yellow-green, ½–¾ in. diameter, shortly petioled, very broadly subreniform-ovate, broader than long, obscurely 3-lobed, remotely sinuate-toothed, densely papillose on both surfaces with depressed mammillated glands. Tendrils stout, often almost corky, white. Female fl.: Crowded, sessile. Ovary sulcate, ovoid, not contracted at the apex; style very stout; stigmas 3, large, villous. Calyx shortly campanulate, with a villous oval ring. Petals very short. Berry ½ in. long, sessile, ovoid, contracted at the apex, hardly beaked. Seeds as in *C. Fenzlii*, but larger, nearly ¼ in. long, with a narrower border.—*Turia Gijef*, Forsk. according to Schweinf. l. c.

Nile Land. Between Atbara and the Red Sea, *Schweinfurth!*

A remarkable species from the stout white woody corky-barked stems and branches, and the curious glandular surface of the leaves, which, and various other parts of the plant, exude a yellow gum-resin. I refer it here chiefly on account of its habit, for the traces of opercular basal dehiscence of the fruit are very obscure.

3. **C. Welwitschii,** *Hook. f.*; (*Rhynchocarpa*) *Naud. in Ann. Sc. Nat. sér.* 4, xviii. 198, t. 10. Root fibrous; base of stem tumid perennial. Branches glabrous, stout and fleshy below, more slender and climbing above, geniculate at the nodes. Leaves ashy-grey, polymorphous, 1–4 in. broad, ovate-cordate in the lower part of the plant, more orbicular and palmately 3–5-lobed in the upper, lobes obovate-oblong or linear, acute, toothed, more or less scabridly pubescent or hispidly scabrid on both surfaces, sinus obtuse, basal rounded; petiole shorter than the blade, longest in young specimens and then sometimes papillose. Tendrils stout. Male fl.: Minute, crowded; peduncle stout, ½–1 in. Calyx urceolate. Corolla 1-16 in. diameter. Stamens short; anthers with short bifid points. Female fl.: Peduncles 1–2, in the same axils as the males, short. Ovary subcylindric, placentas 2; style cylindric, stigmas 2. Berry very shortly peduncled, ½–¾ in. long, subcylindric-oblong, apex rounded and mammillate. Seeds as in *C. Fenzlii.*

Lower Guinea. Elephants' bay, *Currór!* sandy thickets in Loanda, *Dr. Welwitsch!*

4. **C. Ehrenbergii,** *Hook. f.*; (*Rhynchocarpa,*) *Ascherson in Schweinf. Hb. Nub. No.* 61; *Verh. Zool. Bot. Wien Gesell.* 1868, 673. Stem rather slender, shining pubescent with scattered spreading hairs. Leaves green, 1–1¼ in. diameter, 3-lobed to about the middle, tomentose on both surfaces, lobes broad, obtuse or acute, obscurely toothed. Male fl.: Minute, clustered on a short pubescent peduncle. Female fl.: Solitary or fascicled in the same axils as the males. Fruit sessile, ½ in. long, ovoid, narrowed into a short slender beak. Seeds small, 1-10th in.

long, very turgid, oblong, subglobose, dark brown, minutely rugulose, smooth, girt with a slender raised border.

Nile Land. Massowa, *Ehrenberg*. Nubian coast at Suakin, *Schweinfurth!*

I have seen but one small specimen; the seeds are very characteristic, but the foliage is no doubt as polymorphous as in its congeners.

5. **C. Schimperi,** *Hook. f.* Stem rather stout, angular, grooved, scabrous. Leaves ashy grey, 2–4 in. broad, palmately 5-lobed to or below the middle, rather softly pubescent on both surfaces, lobes broad rounded crenulate. Petioles stout. Male fl.: Minute; peduncles stout, pubescent; pedicels very short. Calyx very broadly campanulate. Anthers sessile, the two larger with split connectives. Female fl.: Subsessile. Ovary elongate-ovoid, densely tomentose; stigmas 3. Berry ovoid, $\frac{1}{5}$–$\frac{1}{2}$ in. long, beaked, tomentose. Seeds grey-brown, obliquely subglobose, slightly compressed, $\frac{1}{8}$ in. long, testa rugose with a slender raised border sunk below the surface.

Nile Land. Abyssinia, *Schimper!* No. 413 (1853).

6. **C. etbaicus,** *Hook. f.*; (*Rhynchocarpa*) *Ascherson in Hb. Schweinf. No.* 120. Stem stout, angular, scabrid, deeply grooved, geniculate at the nodes. Leaves ashy grey, 1–2 in. diameter, densely tomentose and scabrid on both surfaces, palmately 3–5-lobed, lobes rounded or oblong, almost quite entire. Fruit oblong or ovoid, $\frac{1}{2}$–$\frac{2}{3}$ in. long, beaked or apiculate, pubescent. Seeds almost globose, $\frac{1}{8}$ in. diameter, grey-brown, faintly granulated, girt with a raised strong border.—? *Æchmandra velutina*, Dalz. in Bombay Flora, 200.

Nile Land. Soturba Hills on the Nubian coast, lat. 22° N., *Schweinfurth!*

Very similar and perhaps identical with Dalzell's plant, found in Sind, which has male peduncles 3–4 in., but without male fl. I cannot identify it.

I strongly suspect that *Rhynchocarpa Courbonii*, Naud. in Ann. Sc. Nat. sér. 4, xviii. 197, is the same as this. Only the male flower is known; it has the long peduncles of *Æch. velutina*, Dalz., and is a native of Massowah and Muscat, thus uniting geographically the habitats of Sind and Abyssinia. My specimen (cultivated in Jardin des Plantes from Herb. Gay.) is dicecious, and the leaves are more scabrid than those of *C. etbaicus* or *Æchmandra velutina*.

7. **C. erostris,** (*Rhynchocarpa*) *Schw. in Verh. Zool. Bot. Wien Gesell.* 1868, 673. Stem sparingly branched, angular, pruinose, sparsely hairy. Leaves orbicular, deeply sinuate-cordate, with 5 obtuse or rounded obscurely toothed angles, scabrous above, tomentose ashy and scabrous below, nerves flattened. Tendrils woody pubescent. Male fl.: Racemes very long, dense-flowered, ebracteate; pedicels puberulous, bracteolate in the middle. Corolla 5-lobed to the middle, yellow-green, three times as long as the calyx. Anthers sessile, cells oblong obtuse, connate by the dilated connective. Female fl.: Racemes short, axillary, sessile, subfascicled, much smaller than the male. Fruit ovoid, orange-yellow, glomerate, base constricted, apex acute or obscurely beaked, 4–6-seeded, resinous when dry. Seeds globose, somewhat compressed, yellow or brown, margined, marked with elevated lines.

Nile Land. Nubian coast, Wady Soturba, 22° N. lat., *Schweinfurth*, No. 120.

I have seen no specimens: the accompanying description is taken from the work quoted above.

Cyrtonema? elegans, Fenzl in Herb. Kotschy, No. 388, from Kordofan, is probably another species of *Corallocarpus*, allied to *C. Fenzlii*, but more slender, with more acute sinuate lobes to the leaf; without ripe fruit it is indeterminable.

33. TRIANOSPERMA, Mart.; Benth. et Hook. f. Gen. Plant. i. 835.

Monœcious or diœcious. Flowers solitary racemose or panicled. Male: Calyx campanulate, 5-fid. Corolla rotate or campanulate, 5-partite, disk often fleshy. Filaments 3, free; anthers connate, one 1-celled, two 2-celled, cells flexuous. Rudiment of ovary 3-lobed. Female fl.: Staminodes 3. Ovary ovoid, 3-celled; style 3-fid, stigmas dilated; ovules 1 or 2 ascending from the base of each cell. Fruit corky or fleshy, indehiscent, 3-seeded. Seeds erect, testa hard.—Glabrous, scandent tropical American and one African perennial-rooted herbs or shrubs. Leaves 3–5-lobed or -foliolate, the upper often entire, often glandular below at the base. Tendrils undivided or 2-or-more-partite. Panicles often bearing tendrils. Flowers rather large.

1. **T. africana,** *Hook. f.* Stem climbing, 15–20 ft.; branches grooved and angled, very slightly scabrid. Leaves $1\frac{1}{2}$–3 in. long, deltoid-ovate or broader and palmately 3-lobed, cordate at the base, acutely toothed, scabrid on both surfaces. Flowers not seen. Fruit axillary, solitary or in pairs, oblong, nearly 1 in. long, obtuse at both ends, smooth, green, 2-seeded; peduncle short, curved. Seeds erect, oblong, much compressed.

Upper Guinea. Camaroons mountain, alt. 1000 ft., *Mann!*

A remarkable discovery, being the only Old World species of the genus, which in the New World extends from the S. U. States to the Argentine provinces.

34. SICYOS, Linn.; Benth. et Hook. f. Gen. Plant. i. 837.

Flowers monœcious. Male: Racemose or corymbose. Calyx-tube shallow; teeth 5, small or 0. Corolla rotate, lobes 5, triangular-ovate. Stamens 2–5, filaments confluent; anthers free or connate, cells curved, sigmoid or conduplicate. Rudiment of ovary 0. Female fl.: In the same or different axils, crowded at the end of a long or short peduncle, rarely solitary. Staminodes 0. Ovary long or short, sometimes beaked, 1-celled, hispid or aculeate; styles short, stigmas 3; ovule 1, pendulous from the top of the cell. Fruit woody or coriaceous, angled or compressed, aculeate or rarely unarmed. Seed filling the cavity of the fruit, testa membranous.—Glabrous or scabrid, climbing or prostrate herbs, chiefly tropical American, often littoral. Leaves membranous, angled or lobed, but rarely deeply. Tendrils 3-fid. Flowers small or minute. Fruit small.

1. **S. angulatus,** *Linn. Sp. Pl.* 1439. Stems stout, climbing and trailing, pilose with spreading hairs, especially at the nodes. Leaves 2–6 in. broad, membranous, palmately 5–7-lobed, cordate at the base,

lobes broad, acute or acuminate, irregularly toothed, the middle one often longest, hairy on both surfaces. Male fl.: Peduncle 2–8 in. long. Flowers green, minute, $\frac{1}{6}$ in. diameter, densely racemose at the top of the peduncle. Anthers sessile forming a capitulum on the columnar connate filaments; cells contorted. Fruits crowded in a shortly peduncled capitulum, ovate, compressed, $\frac{1}{3}$ in. long, densely hispid with barbed setæ.—Seringe in DC. Prod. iii. 309; A. Rich. Fl. Abyss. i. 296? *S. Schimperi*, Naud. in Schweinfurth & Ascherson's Appendix to Beitr. Fl. Æthiop. 268.

Nile Land. Abyssinia, *Schimper!*
Lower Guinea. Thickets in Huilla, *Dr. Welwitsch!*
Also a native of N. and S. America and the coasts of Australia and New Zealand.

Order LXV. **BEGONIACEÆ.** (By Dr. Hooker.)

Flowers monœcious, unsymmetrical. Male: Perianth-segments 2 or more, petaloid; 2 outer opposite, valvate, inner imbricate or 0. Stamens indefinite, inserted on a small receptacle; anthers adnate to the filaments, free or connate; cells dehiscing laterally. Rudimentary ovary 0. Female fl.: Perianth-segments 2, opposite or more variously arranged. Staminodes 0. Ovary inferior, 2–4- rarely 1-celled, 3–4-angled or winged; styles 2–5, free or connate, stigmas capitate, linear or 2-fid, arms papillose all over or in a long spiral line; ovules excessively numerous, on axile projecting simple or lobed placentas. Fruit a loculicidal rarely septicidal capsule, rarely a fleshy berry, 2–3- rarely 4- or more-celled. Seeds very numerous, minute, testa reticulate, albumen thin or 0; embryo ovoid or subcylindric; cotyledons very short.—Herbs or undershrubs, sometimes stemless, usually succulent. Leaves alternate, sometimes distichous, unequal-sided. Stipules free, deciduous. Cymes axillary, uni- or bi-sexual; bracts and bracteoles usually opposite, caducous. **Flowers often handsome, rosy or white, rarely yellow or red.**

A very large Tropical especially American Order, or rather genus, for the Order contains besides *Begonia*, but one anomalous member, the Sandwich Island *Hillebrandia*, which has 5 equal calyx-lobes, as many minute petals, and a capsule dehiscing at the apex above the insertion of the calyx-lobes.

1. **BEGONIA,** Linn.; Benth. et Hook. f. in Gen. Plant. i. 841.

Characters of the Order.

The African species are for the most part berried, and more or less imperfect; they are, moreover, extremely difficult of analysis from dried specimens, and much allowance must be made for the following descriptions.

§ 1. *Monœcious. Stem erect, tall. Sepals* 2. *Petals* 2. *Styles* 4, *terete, simple, stigmatic on the inner surface towards the tip. Fruit long, slender,* 4-*angled.*

Leaves ovate-oblong, long-petioled, base cordate	1. *B. Mannii.*
Leaves linear or linear-oblong, base cordate	2. *B. furfuracea.*
Leaves ovate-oblong, short-petioled, base rounded	3. *B. excelsa.*
Leaves narrow-lanceolate, petiole very short	4. *B. polygonoides.*

§ 2. *Monœcious. Stem* 0 *or very short. Leaves and peduncles radical. Sepals* 2. *Petals* 0. *Styles* 3–4, *stigmas capitate, entire or shortly forked. Fruit slender,* 3–4-*angled.*

Leaves peltate entire. Stigmas 3 . . . . . 5. *B. scapigera.*
Leaves sub-peltate entire. Stigmas 4 . . . . . 6. *B. scutifolia.*
Leaves sub-entire or 2–3-lobed. Stigmas 4 . . . . . 7. *B. prismatocarpa.*

§ 3. *Monœcious. Rootstock creeping; stem erect. Leaves alternate. Sepals* 2. *Petals* 0. *Styles* 3, *stigmas forked. Fruit fusiform, narrowed at both ends, membranous, not winged.*

Leaves broad, unequally 3–5-lobed . . . . . 8. *B. oxyloba.*

§ 4. *Monœcious. Stem erect, very short. Sepals* 2. *Petals* 0. *Styles* 3–6; *stigmas forked. Berry subglobose not winged, with branching placentas.*

Leaves sub-orbicular, 1–2 ft. diameter. Cymes effuse . . . 9. *B. baccata.*
Leaves sub-orbicular, long-petioled, 6–7 in. diameter. Cymes contracted . . . . . 10. *B. ampla.*
Leaves obliquely ovate, short-petioled. Cymes contracted . 11. *B. poculifera.*

§ 5. *Monœcious. Rootstock short, or slender and creeping. Leaves and peduncles radical. Sepals* 2. *Petals* 0. *Styles* 3-4, *stigmas forked. Fruit* 3–4-*winged, coriaceous, indehiscent; placentas branched.*

Leaves not peltate . . . . . 12. *B. peperomioides.*
Leaves peltate; petiole near the margin . . . . . 13. *B. hirsutula.*
Leaves peltate; petiole far from the margin.
  Leaves ovate, sub-entire, petiole stout hirsute . . . . . 14. *B. Scutulum.*
  Leaves ovate-oblong, toothed, petioles hirsute . . . . . 15. *B. anisosepala.*
  Leaves ovate, petioles slender glabrous . . . . . 16. *B. clypeifolia.*

§ 6. *Monœcious. Stem erect. Leaves distichous. Sepals* 2. *Petals* 0. *Styles* 3; *stigmas forked or capitate. Capsule membranous,* 3-*winged, dehiscing longitudinally.*

Leaves sessile, hirsute, much-toothed . . . . . 17. *B. elatostemmoides.*
Leaves petioled, glabrous, sub-entire . . . . . 18. *B. auriculata.*
Leaves sessile, glabrous, sub-entire . . . . . 19. *B. sessilifolia.*
Leaves pinnatisect . . . . . 20. *B. asplenifolia.*

§ 7. *Monœcious. Stem erect. Leaves alternate. Sepals* 2. *Petals* 2–3. *Styles* 3; *stigmas forked. Fruit* 3-*celled,* 6-*winged, dehiscing longitudinally.*

Leaves obliquely falcate . . . . . 21. *B. Annobonensis.*

§ 8. *Monœcious. Annual. Sepals* 2. *Petals* 2–3. *Styles* 3; *stigmas forked. Capsule membranous,* 3-*winged, dehiscing longitudinally.*

Leaves ovate-oblong, very obliquely cordate . . . . . 22. *B. rostrata.*

§ 9. *Dicœcious. Stem or rootstock slender, creeping. Leaves and peduncles radical. Sepals* 2. *Petals* 2.

Stem very long, slender. Leaves 2–3 in.? . . . . . 23. *B. elæagnifolia.*
Stem very stout. Leaves 6–9 in. . . . . 24. *B. squamulosa.*

Of doubtful position.

Stem climbing rooting slender. Leaves oblong . . . . . 25. *B. epiphytica.*
Stem erect, very stout. Leaves very thick elliptic-lanceolate 26. *B. loranthoides.*

1. **B. Mannii,** *Hook. Bot. Mag. t.* 5434. Monœcious. Stem 2–3 ft., stout, woody, terete, branching. Branchlets, young parts, petioles, nerves beneath and inflorescence clothed sparsely or densely with rusty

furfuraceous pubescence. Leaves long-petioled, 4–7 by 1½–2½ in., oblong-ovate or lanceolate from an unequal cordate base, acuminate, irregularly sinuate-toothed, glabrous above, puberulous or glabrate beneath; petioles 1–3 in.; stipules ½–1 in., lanceolate. Cymes axillary, shortly peduncled. Male fl.: Numerous, rose-red, corymbose on a short peduncle, drooping, ⅔ in. diameter. Sepals 4, subovate. Petals 2, smaller, linear-oblong. Anthers few, ovoid, subsessile, crowded into a small ovoid head. Female fl.: 3 together, very shortly pedicelled on a short peduncle. Sepals 2, narrower than in the male. Petals 2. Ovary linear, ¾–1 in., 4-angled, scaly, tomentose, 4-celled; stigmas 4, linear-clavate, papillose on the inner surface towards the tip. Capsule linear, 1–1½ in., tomentose.—A. DC. Prod. xv. pt. 1, 517.

Upper Guinea. Fernando Po, and Old Calabar, *Mann! Thomson!* Fl. Feb.
A similar species with smaller leaves was collected on trees in Prince's Island by Barter; but the specimens are very imperfect.

2. **B. furfuracea,** *Hook. f.* Monœcious? All parts but the leaves above clothed with soft appressed stellate ferruginous and furfuraceous down. Stems 3 ft.; rather woody, terete, angularly flexuous, with large circular leaf-scars at the angles. Leaves distichous, short-petioled, 5–7 by 1–1½ in., linear-oblong or lanceolate from an obliquely rounded or cordate base, long-acuminate, sinuate-toothed, glabrous above; nerves few, diverging; petioles ¼–½ in.; stipules large, dimidiate-lanceolate, tomentose, caducous. Cymes axillary, shortly pedicelled, several flowered; bracts ovate, stellately woolly. Male fl.: Sepals 4, suborbicular, stellately-pubescent. Petals 2, narrow, linear. Anthers in an ovoid head, obtuse; filaments indistinct. Capsule 2 in., densely tomentose, linear.

Upper Guinea. Fernando Po, alt. 1300 ft., on trees, *Mann!* Male flowers unknown.

3. **B. excelsa,** *Hook. f.* Monœcious. Stem climbing, branched, 8–10 ft. Branches stout, woody, terete; branchlets, petioles, nerves beneath and inflorescence clothed with rusty furfuraceous pubescence. Leaves short-petioled, 3–4½ by 1½–2 in., elliptic-ovate ovate-oblong or lanceolate from a very unequal subcordate base, acuminate, obscurely sinuate-toothed, pubescent beneath; petiole ¼–⅔ in., stipules 1–1½ in. lanceolate. Cymes axillary, few-flowered; peduncle ¼ in. Male fl.: Sepals 2, oblong, obtuse, ¼ in. long. Petals 2. Anthers in an oblong subunilateral head, oblong, obtusely apiculate; filaments shortly connate at the base. Female fl.: 1 in. diameter. Sepals as in the male flowers. Stigmas 4, elongate, terete, stigmatic surface a flat linear-oblong disk on the inner surface at the apex. Ovary ½–¾ in. long, 4-gonous. Capsule 2 in. long, linear, tomentose.

Upper Guinea. Cameroons mountains, alt. 4000 ft., *Mann!*
Closely allied to *B. epiphytica*, but of a very different habit and with much shorter petioles.

4. **B. polygonoides,** *Hook. f.* Monœcious; glabrous. Stems very slender, flexuous, several feet long, as thick as a duck's quill, angular,

brown, shining and woody. Leaves scattered, very shortly petioled, 3–3½ by ½–⅔ in., narrow, elliptic-lanceolate, quite entire, slightly oblique, acuminate, base acute, membranous (fleshy when fresh?) nerves and costa very slender, surfaces quite similar; petiole ⅛ in.; stipules subulate-lanceolate, minutely stellately-pubescent when young. Peduncles axillary, capillary, ½ in. long, dichotomously forked and 2–3-flowered or simple; bracts at the forks minute, oblong, membranous, obtuse; pedicels short, capillary. Male fl.: Minute. Sepals 2, oblong, obtuse, ⅕ in. long. Petals 2, narrow-linear. Anthers 8, linear-subulate, acute, as long as the sepals; filaments connate into a short column. Female fl.: Solitary? shortly peduncled. Sepals and petals as in the male, but larger. Styles not seen. Ovary very slender, ¼ in. Immature capsule nearly 1 in. long, narrow, fusiform, attenuated at both ends, quite glabrous, very membranous.

Upper Guinea. Old Calabar, *Thomson!*
A very curious species, closely resembling in the dried state *Polygonum aviculare*.

5. **B. scapigera,** *Hook. f.* Monœcious. Stemless, almost quite glabrous. Rootstock woody, creeping. Leaves all radical, 4–8 by 2–4 in., very long (5–10 in.) -petioled, peltate, obliquely ovate, caudate-acuminate, rounded at the base, obscurely sinuate-toothed or quite entire, ciliate towards the tips, nerves about 10, radiating from the top of the petiole, slender; petioles stout, rarely with a few long hairs; stipules small, ovate, membranous, ciliate. Scape solitary, erect, stout, 10–14 in., slightly hairy above, usually forked, 2–3-bracteate at the forks, monœcious; bracts and bracteoles small, orbicular or oblong, ciliate-toothed. Flowers erect, solitary or several together, terminating the scape or its branches, subumbellate, all male or female and male mixed. Male fl.: 1½ in. diameter. Pedicels ¾–1½ in. long. Sepals 2, orbicular. Stamens numerous; filaments connate at the base; anthers small, oblong, obtuse, equalling the free portion of the filament. Female fl.: Similar, but smaller, sessile or very shortly pedicelled. Ovary 1½–2 in. long, very slender; styles 2; stigmas forked, arms short, papillose band continuous, twisted. Capsule very slender, 1½ in. long, glabrous.

Upper Guinea. Cameroons mountains, alt. 4000 ft., *Mann!* Fl. Dec.

6. **B. scutifolia,** *Hook. f.* Monœcious. Stemless. Rootstock creeping. Leaves all radical, subpeltate, very long-petioled, 1½–2½ in. by 1½–2 in., obliquely ovate or rotundate, acuminate, gibbous, depressed at the petiole, margin ciliate, obscurely sinuate-toothed or quite entire, glabrous above and below; nerves 5–7, radiating from the top of the petiole, very fine, hairy below; petiole peltately attached just within the margin, hirsute with curled hairs, 1½–4 in.; stipules ovate, obtuse, membranous, long-ciliate. Scapes very slender, shorter than the petiole, hairy, usually 2 collateral, one with 1 female-fl., the other with 2 male pedicelled, and one female sessile fl. at the top; bracts and bracteoles small, ovate, membranous, brown, long-ciliate with curled hairs.

Male fl.: pedicel slender, $\frac{1}{8}$–$\frac{1}{4}$ in. Sepals 2, orbicular, $\frac{1}{4}$ in. diameter, ciliate, and slightly hairy on the back. Stamens in a globose head; filaments connate at the base; anthers oblong, obtuse. Female fl.: Sepals 2, smaller than in the male. Styles 4, united below; stigmas peltate, capitate. Ovary $\frac{1}{4}$ in., linear, 4-celled, more or less hairy. Capsule 4-angled, narrow, fusiform.

Upper Guinea. On rocks, Sierra del Crystal, *Mann!* Fl. July.

7. **B. prismatocarpa,** *Hook. Bot. Mag. t.* 5307. Monœcious. Slender, dwarf. Stems creeping and rooting below, much branched, tufted, with the petioles laxly hirsute with curled hairs; branches ascending, 1–3 in. Leaves alternate 1–2 in. by $\frac{1}{2}$–1 in., long-petioled, very obliquely ovate or suborbicular, base rounded or cordate, unequally 2- rarely 3-lobed, lobes subacute, irregularly sinuate-toothed, sparingly hairy on both surfaces; nerves 3–6 from the top of the petiole, slender, hairy beneath. Stipules ovate, ciliate; petiole 1–3 in. Scapes as long as the leaves, axillary, very slender, with one sessile female fl. or two pedicelled male and one sessile female fl. at the top; bracteoles lanceolate, long-ciliate. Male fl.: Sepals 2, suborbicular, yellow, $\frac{1}{4}$–$\frac{1}{3}$ in. diameter, glabrous. Stamens in a globose head; filaments connate at the base; anthers oblong, obtuse. Female fl.: Sepals 2, like the male. Styles 4, connate below, stigmas capitate; ovary linear, glabrous, 4-celled. Capsule fusiform, 4-angled, 4-celled, quite glabrous.—A. DC. Prod. xv. pt. 1, 389.

Upper Guinea. Fernando Po, on rocks and trees, ascending to 3000 ft., *Barter! Mann!* Fl. Dec.

8. **B. oxyloba,** *Welw. mss.* Monœcious. Quite glabrous. Rootstock long, woody. Stem 1–2 ft. high, succulent, stout, sparingly branched. Leaves long-petioled, 2–7 in. diameter, membranous, obliquely reniform, unequally palmately 5-lobed, 5-nerved from the deeply cordately 2-lobed base, lobes broadly triangular, irregularly toothed, teeth often hair-tipped; petiole 4–7 in.; stipules $\frac{3}{4}$–1 in., ovate-lanceolate, with ciliate teeth and very long points. Cymes short, axillary, 1–2-sexual; peduncle $\frac{1}{2}$ in. long; bracts very variable, elliptic-ovate or oblong, concave, acute. Central male fl.: 1 in. diameter, pedicel slender, 1 in. long; of other male fl. pedicel $\frac{1}{4}$–$\frac{3}{4}$ in., glabrous. Sepals 2, $\frac{1}{4}$–$\frac{1}{2}$ in. long, orbicular-oblong, rose-red, striped. Stamens subunilateral; filaments free; anthers linear-obovate, obtuse. Female fl.: more shortly pedicelled. Sepals similar. Styles 3, stigmas forked, arms short, scarcely twisted, stigmatic band continuous. Capsule 3-gonous, membranous, bursting irregularly, $\frac{1}{2}$–$\frac{3}{4}$ in. long, elliptic, acute at both ends; placentas apparently with 2 spreading lobes.

Upper Guinea. Fernando Po, alt. 3000 ft., and Cameroons mountains, alt. 4000 ft., *Mann!* Fl. Dec. and Feb.
Lower Guinea. Angola, Golungo Alto, *Dr. Welwitsch!* Fl. July.

9. **B. baccata,** *Hook. Bot. Mag. t.* 5554. Monœcious. Stem 3–4 ft., very robust, as thick as the thumb, densely clothed with ferruginous

pubescence, as are the petioles, pedicels, and nerves beneath. Leaves petioled, 1–2 ft. long and broad, obliquely suborbicular, deeply cordate, abruptly acuminate, obscurely toothed, glabrous or puberulous beneath; petioles 3–5 in. to a span long, very stout. Stipules very large, ½ in. long and broad, concave, oblong, obtuse, deciduous. Peduncles unisexual, axillary, shorter than the leaves, stout, much divaricatingly branched, many-flowered; pedicels 1–1½ in.; bracts ovate-oblong. Male fl.: Sepals 2, elliptical-orbicular, concave, white, 1 in. long. Petals 0. Anthers many, unilateral, linear, obtuse; filaments very short, free. Female fl.: Sepals of the male. Styles 5–6, free; stigmas forked, arms linear; papillose band continuous, twisted. Ovary 5–6-celled; placentas on the septa, branched. Berries in open dichotomously branched cymes 12–18 in. diameter, subglobose, obscurely 4-angled, ¾ in. diameter, pubescent.

Upper Guinea. St. Thomas Island, alt. 4000 ft., on trunks of trees, *Mann!*

10. **B. ampla,** *Hook. f.* Monœcious. Stem 1–2 ft., very stout, woody, together with the petioles and nerves beneath sparsely furfuraceous, young leaves densely clothed with rusty stellate down. Leaves long-petioled, 8–10 in. diameter, obliquely suborbicular or very broadly obliquely ovate, deeply cordate, abruptly contracted into a slender point, obscurely toothed at the tip of the once or twice forked nerves, palmately 6-nerved, upper surface with a few scattered minute stellate membranous scales that are more numerous below; petiole stout, 5–8 in.; stipules large, green, convolute, 1½ in. deciduous. Peduncle stout, 1–2 in., terminated by 2 large convolute orbicular bracts together forming a subcampanulate cup ¾ in. long and broad, enclosing numerous shortly pedicelled flowers. Male fl.: Sepals 2, rose-coloured, orbicular-obovate, 1 in. long. Anthers small, subsessile, linear, obtuse. Female fl.: Sepals of the male. Styles 3–4, short, free; stigmas forked, branches rather long, papillose band broad, continuous, twisted. Ovary 3–4-angled? Berry enclosed in the bracts, subglobose, ½ in. diameter; placentas much branched.

Upper Guinea. On trees, Prince's Island, *Barter!* Fernando Po, alt. 1–2000 ft., *Mann!*

11. **B. poculifera,** *Hook. f.* Monœcious. All parts sparsely clothed with minute circular epidermal scales or flattened vesicles. Stem robust, climbing 16 ft. high, branched, spongy; bark smooth, rather shining. Leaves petioled, fleshy, 5–7 in. by 2½–3 in., very obliquely ovate-falcate, long-acuminate, quite entire, base rounded or truncate, 3-nerved; upper surface sublucid, green with red nerves and margin, lower paler, more densely vesicular; nerves few, thick; petiole ½–1 in., very stout; stipules 1 in., convolute, coriaceous, oblong, green and dilated at the apex. Peduncles in the upper axils short, 1–1½ in., strict, very stout, terminated by two opposite broadly orbicular rose-coloured bracts, that together form a 2-lobed subcampanulate several-flowered cup ¾ in. long, and as broad. Male fl.: Apparently protruded one by one from

the cup, pedicel stout, 1 in. Sepals 2, orbicular, $1\frac{1}{4}$ in. diameter. Anthers small, sessile, linear, obtuse.

Upper Guinea. Fernando Po, on trees, alt. 2000 ft., and Cameroons mountains, alt. 4000 ft., *Mann!*

12. **B. peperomioides,** *Hook. f.* Monœcious. Stemless. Glabrous except the rusty pubescent young petioles and nerves beneath. Rootstock woody, rooting copiously, as thick as a goose-quill. Leaves subterminal, long-petioled, rather coriaceous, erect, 5–6 in. by 2–$2\frac{1}{2}$ in., very obliquely elliptic-obovate or oblanceolate, gibbous, long-acuminate, base acute or attenuate, quite entire or obtusely sinuate-toothed above the middle, 3-nerved at the base, midrib with alternate nerves, dull green above, paler below; petioles very slender, longer or shorter than the blade, with sometimes a few spreading setæ at the base; stipules sheathing, fimbriate at the tip. Peduncle radical, very short, with one female and several male shortly pedicelled terminal flowers. Male fl.: Sepals 2 ? orbicular, $\frac{1}{3}$ in. diameter, glabrous. Anthers linear, obtuse, filaments very short. Female fl.: Sepals as in the male. Styles 3; stigmas forked, arms rather long; papillose band continuous, twisted. Ovary 3-gonous. Fruit decurved, coriaceous, glabrous, obconic, 3-angled; wings erecto-patent, narrow, coriaceous, acute or obtuse, variable in length; placenta much branched.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

13. **B. hirsutula,** *Hook. f.* Stemless. Rootstock woody, creeping, rigid. Leaves peltate from very near the base, petioled, coriaceous, 4–5 in. by 1–$1\frac{1}{2}$ in., obliquely linear-oblong or oblong-lanceolate, subfalcate, acuminate, base usually contracted, unequally rounded or subauricled, irregularly obtusely toothed or serrate, above glabrous, opaque, dull green and red, midrib and alternate nerves beneath subhirsute or glabrate; petiole 1–$2\frac{1}{2}$ in., stout, strigose-hirsute; stipules lanceolate, fimbriate. Peduncle radical, glabrate, much shorter than the petiole; several-flowered. Flowers not seen. Fruit decurved, coriaceous, turgid, 3-lobed, rhombic, broader than long, $\frac{1}{3}$ in. diameter, 3-angled, glabrous; wings coriaceous, produced laterally, longer than the fruit is broad.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

14. **B. Scutulum,** *Hook. f.* Monœcious. Stemless. Rootstock woody, creeping. Leaves peltate, petiole long, distant from the margin, 4 in. by $3\frac{1}{2}$ in.; coriaceous, broadly obliquely ovate, obtuse or acute, obscurely crenate, rounded at the base, margin ciliate here and there; both surfaces glabrous, palmately 7–8-nerved, nerves hirsute below; petiole 4–5 in., stout, densely crinite, with long shaggy subpaleaceous hairs; stipules ovate-lanceolate, fimbriate. Peduncle radical, shorter than the petiole, slender, hirsute, with one female and several male flowers at the top; bracteoles $\frac{1}{5}$ in., oblong and fimbriate. Male fl.: Pedicels $\frac{1}{2}$–1 in., slender, hairy. Sepals 2, orbicular, $\frac{3}{4}$ in. diameter,

hairy on the back. Petals 0. Anthers numerous, subsessile, linear, obtuse, curved. Female fl.: Sepals as in the male. Petals 0. Styles 3, stigmas forked, arms erect; papillose band continuous, twisted. Fruit (immature) subcuneate, 3-gonous, hairy, $\frac{1}{3}$ in. long; wings produced upwards, coriaceous, tips acute.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

15. **B. anisosepala,** *Hook. f.* Monœcious. Stemless. Rootstock hard, creeping and rooting, upper part densely clothed with stipules. Leaves peltate, petiole distant from the margin, 3–4 in. by $1\frac{1}{2}$–2 in., obliquely ovate-oblong, curved, sides very unequal, obtuse or acute, rounded at the base, crenate-toothed, with a cilia in the sinus and often on the tooth also, glabrous, dull green above, mottled with red, paler beneath, palmately 6–7-nerved; nerves hirsute or ciliate or glabrous; petiole shorter than the blade, densely hirsute with curled spreading hairs; stipules ovate-oblong, obtuse, laciniate and ciliate. Peduncles radical, shorter than the petioles, slender, glabrate, with 2 or more terminal flowers; bracts like the stipules but small, $\frac{1}{8}$ in. Male fl.: Sepals 2, very unequal, one orbicular $\frac{1}{3}$ in. long, the other narrower, oblong; usually one is red the other white. Petals 0. Anthers linear-oblong, obtuse, rather longer than the free filaments. Female fl.: not seen. Fruit coriaceous, glabrous, turgid, 4-gonous, long-stipitate, angles produced upwards into coriaceous obtuse or acute wings; placentas much branched.

Upper Guinea. Sierra del Crystal and Mount John river, Kongui, near the Gaboon, *Mann!* Fl. Sept.

16. **B. clypeifolia,** *Hook. f.* Monœcious. Stemless. Rootstock woody, creeping, upper part clothed with stipules. Leaves very long-petioled, 3–$4\frac{1}{2}$ in. by $1\frac{1}{2}$–2 in., peltate distantly from the margin, obliquely ovate or ovate-lanceolate, obtuse or acute, rounded at the base, quite entire or obscurely sinuate-toothed, opaque, glabrous, dull green above, reddish beneath, palmately 8-nerved; nerves slender, ferruginously pubescent; petiole 4–6 in., very slender, subfurfuraceously pubescent. Stipules oblong, obtuse, laciniate and ciliate. Peduncles with rusty pubescence, very short, radical, terminating with one female and one or more male flowers on slender pedicels $\frac{1}{4}$–$\frac{1}{2}$ in.; bracts like the stipules. Male fl.: Sepals 2, orbicular, $\frac{1}{3}$ in. diameter, slightly pubescent, veined. Petals 0. Anthers linear-oblong, obtuse, filaments very short. Female fl.: Sepals as in the male. Styles 3–4, connate at the base; stigma forked, arms rather long, papillose band continuous, twisted; ovary 3–4-angled and winged. Fruit stipitate, rhombic, turgid, $\frac{1}{3}$–$\frac{1}{2}$ in. diameter, 3–4-angled, coriaceous, ferruginous-pubescent; wings medial, long or short, obtuse or acute; placentas stipitate, much branched.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

17. **B. elatostemmoides,** *Hook. f.* Monœcious; hirsute with curled spreading hairs. Stem creeping and rooting at the base, then

erect, 6–10 in., simple, slender, rigid, as thick as a sparrow's quill. Leaves alternate, distichous, shortly petioled, $1\frac{1}{2}$–$2\frac{1}{2}$ in. by $\frac{2}{3}$–1 in., obliquely obovate or oblanceolate or subrhomboid-oblong, long-acuminate, obscurely lobed beyond the middle, coarsely irregularly toothed, equally hirsute on both surfaces, lower margin rounded and auricled, upper narrower, shorter, and acute at the base; nerves alternate. Stipules $\frac{1}{4}$ in., oblong, toothed and ciliate; petiole $\frac{1}{10}$–$\frac{1}{8}$ in. Flowers small, in subterminal, few-flowered, decurved cymes, clothed with stipule-like bracts; female solitary in the axils below the males. Male fl. (young only seen): Sepals 2, suborbicular, hairy at the back. Petals 0. Anthers linear-oblong, curved, obtuse. Female fl.: Sepals $\frac{1}{4}$ in. long, orbicular-oblong. Petals 0. Ovary 3-gonous; styles 3, stigmas forked, arms very short, papillose band continuous. Capsule decurved, $\frac{1}{3}$–$\frac{1}{2}$ in. long, oblong-rhomboid or ovoid or truncate, pilose; wings membranous, rounded; faces keeled between the wings; dehiscence longitudinal.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

18. **B. auriculata,** *Hook. f.* Monœcious, glabrous throughout. Stems stout, 6–12 in.? unbranched? Leaves alternate, distichous, petioled, 4–6 in. by 2–$2\frac{1}{2}$ in., obliquely obovoid or obovoid-oblong or lanceolate, long-acuminate, quite entire or obscurely toothed, opaque and glabrous on both surfaces, base oblique, excised on the upper margin, lower margin produced into a large rounded incurved auricle, upper margin with a smaller auricle; nerves alternate; stipules $\frac{1}{3}$ in. long, broadly oblong or orbicular, green, quite entire or tip toothed, persistent; petiole stout, $\frac{1}{3}$–$\frac{2}{3}$ in. Cymes subterminal, short, decurved, clothed with imbricating green stipule-like bracts, few-flowered. Sepals 2, suborbicular. Male fl.: Peduncle slender. Sepals apparently as in *B. elatostemmoides.* Capsule $\frac{1}{2}$ in. long, pedicel slender decurved rhomboid-orbicular or obovate, 3-winged; wings rounded, membranous; sides keeled between the wings; dehiscence longitudinal.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

19. **B. sessilifolia,** *Hook. f.* Monœcious? Stem 1–2 ft., slender, simple or branched, rather rigid, substrigose towards the tip and on the nerves beneath. Leaves alternate, subsessile, distichous, 3–4 in. by 1–$1\frac{1}{2}$ in., obliquely elliptic-lanceolate or oblanceolate, long-acuminate, obscurely sinuate or quite entire, base oblique excised on the upper margin, lower margin produced into a small incurved auricle, upper surface lurid green, opaque, lower paler; petiole $\frac{1}{16}$–$\frac{1}{8}$ in.; stipules $\frac{1}{4}$ in., broadly elliptic-oblong, flat, green, toothed and ciliate. Peduncles short axillary, decurved, strigose, few-flowered, clothed with flat imbricating oblong bracts like the stipules; pedicels very short; bracteoles linear. Male fl.: Small, all in the upper cymes. Sepals 2, $\frac{1}{4}$ in., broadly oblong, obtuse, white. Anthers about 16, subunilateral, linear-oblong, emarginate, filaments very short. Female fl. and capsule not seen.

Upper Guinea. Fernando Po, alt. 1000–2000 ft., *Mann!* Fl. Nov.

20. **B. asplenifolia,** *Hook. f. in A. DC. Prod.* XV. *pt.* 1, 392. Monœcious. Stem rigid, slender, erect, 12–18 in., from a creeping woody rootstock, dichotomously branched; branches strigosely hirsute at the tips, as thick as a sparrow's quill. Leaves alternate, subsessile, 1–2½ in., oblong-lanceolate in outline, pinnatisect, lobes 5–7 on each side, erecto-patent, distant, narrow, linear-obovate, decurrent at the base, lobulate, 1–5-toothed, teeth tipped with a cilia, rachis and ribs strigose-hairy, segments sparsely setose above, glabrous except the midrib below. Stipules deciduous, oblong, long-ciliate. Cymes in the uppermost axils, 1–few-flowered, and all male; pedicels very short; bracteoles lanceolate, laciniate. Male fl.: Sepals 2, suborbicular, ⅛ in. diameter. Petals 0. Anthers 10–14, oblong, obtuse; filaments connate at the base. Female fl.: Solitary (always?) in axils below the male. Sepals as in the male. Petals 0. Ovary 3-gonous; styles 3; stigmas capitate sinuous. Capsule ¼ in. long, hairy, on a curved short pedicel, rhomboid, faces ribbed between the wings, dehiscing longitudinally; wings 3, membranous, with rounded, ciliate angles, cellular, whitish; placentas entire.

Upper Guinea. Top of Mount Naveya, in the Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

21. **B. Annobonensis,** *A. DC. Prod.* XV. *pt.* 1, 315. Monœcious. Stem succulent, very stout, with broad stipular scars at the nodes. Leaves petioled, 3–3½ in. by 1½ in., very obliquely falcate, ovate-cordate, acute, 2-crenate, palmately 5–6-nerved, glabrous and shining above, beneath with very sparse membranous scales; petiole stout, 1–1½ in., with a few stout setæ and a whorl of reflexed fimbriate scales at the apex; stipules ¼ in., oval, acute, very membranous, deciduous. Peduncle axillary, shorter than the leaves, much elongate in fruit, bearing an irregular corymb of pedicelled flowers. Male fl.: Sepals 4, two outer suborbicular, ⅓ in. diameter; two inner smaller. Anthers orbicular-oblong, obtuse, longer than the filaments which are inserted on a small torus. Female fl.: Sepals 5, subequal. Styles 3, very short; stigmas forked, branches short, thick; papillose band continuous. Ovary 3-gonous, 3-celled. Capsule ⅓ in. long, membranous, 3-gonous, 6-winged, broader and truncate upwards; dehiscence longitudinal; wings short, very variable, those opposite the septa smaller, inserted lower down; placentas 2-partite.

Upper Guinea. Annobon Island, *Dr. Curror!*

22. **B. rostrata,** *Welw. ms.* Monœcious, annual, erect. Stem 1–2 ft., slender or stout, sometimes as thick as the middle finger, cylindric. Leaves long-petioled, 3–6 in. by 1½–2½ in. very obliquely ovate-oblong, long-acuminate, with a reniform base completely on one side, deeply broadly doubly crenate-toothed, membranous, covered with few long soft scattered hairs, shining when dry; petiole as long as the blade, with a whorl of hairs at its apex. Stipules small ovate, hair-pointed, deciduous. Cymes often springing from every axil, very much

shorter than the petioles, with one female and several male flowers; pedicels very slender, $\frac{1}{8}$–$\frac{1}{2}$ in.; bracts small ovate or orbicular, hair-pointed. Flowers $\frac{1}{3}$ in. diameter, males the largest, pale rose-coloured. Sepals elliptic-ovate, subacute; petals smaller, 2 equal, with often a third much smaller one. Anthers minute, elliptic, obtuse; filaments connate at the base. Ovary 3-gonous, with 2 narrow and 1 produced wings; placentas of two flat plates; styles 3, very short; stigmas forked, arms twisted, obtuse, papillose band continuous. Capsule $\frac{1}{3}$ by $\frac{3}{4}$ in., membranous, two of the wings short straight, the third produced almost horizontally into an elongated triangular form, obtuse at the tip; valves broad, dehiscing from the base upwards and almost deciduous, chiefly adhering to 3 spongy cellular plates which occupy the sinus between the wings and are continuous with the 3 principal vascular cords of the capsule; as the capsule breaks up the valves and these cellular plates separate from the wings and central placentiferous axis.

Lower Guinea. Angola, prov. Pungo Andongo, alt. 2000–3800 ft., *Dr. Welwitsch!* Fl. April.

Allied to *B. Sutherlandii* and other Natal species.

23. **B. elæagnifolia,** *Hook. f.* Dicœcious? Stem very long and slender, as thick as a sparrow's quill, creeping, rooting at the nodes only, and with the petioles, peduncles, and leaves beneath clothed with minute, membranous, fimbriate, appressed scales. Leaves solitary at the distant nodes, erect, petioled, $2\frac{1}{2}$–3 by $\frac{2}{3}$–1 in., rather coriaceous, elliptic-lanceolate, long-acuminate, slightly oblique, base subacute, quite entire or obscurely few-toothed, 3-nerved at the base, dull green and opaque above, paleæ reddish and glistening with the scales beneath; petiole slender, shorter than the blade; stipules subulate-lanceolate, quite entire, $\frac{1}{4}$ in., caducous. Peduncle axillary, $\frac{1}{4}$–$\frac{1}{2}$ in., 2-flowered; bracteoles minute, membranous; pedicels slender, $\frac{1}{4}$ in. Male fl.: Sepals 2, pink, orbicular, $\frac{1}{6}$ in. diameter. Petals much smaller, linear-oblong, obtuse. Anthers linear, obtuse; filaments combined into a short column. Female flower and fruit unknown.

Upper Guinea. On trees, Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

24. **B. squamulosa,** *Hook. f.* Stemless. Rootstock woody, creeping, rooting all along, as thick as a goose-quill, and, as well as the peduncles, petioles, and leaves beneath, clothed with minute membranous fimbriate appressed scales. Leaves solitary, rather distant, erect, coriaceous, 6–9 in. by $2\frac{1}{2}$–$4\frac{1}{2}$ in., elliptic-oblong, slightly oblique, abruptly acuminate, base rounded or acute, green and glabrous above, reddish with scattered scales below, nerves alternate, distant, slender; petioles stout, shorter than the blade; stipules very large, 1 in., convolute, base broadly ovate, tip long subulate, scaly, persistent. Peduncles 1 in. long, stout, erect, 6–10-flowered; bracts broad, membranous, obtuse, persistent, scaly, forming an involucre; pedicels slender, umbellate, $\frac{1}{4}$ in. Male fl.: Sepals 4, rose-red, outer orbicular, $\frac{1}{4}$ in. diameter, concave, scaly on the backs; inner much smaller, linear-oblong.

Anthers linear, obtuse; filaments very short. Female flower and fruit unknown.

Upper Guinea. Sierra del Crystal, Gaboon river, *Mann!* Fl. July.

25. **B. epiphytica,** *Hook. f.* Stem slender, 1½ ft. long, creeping and rooting at the nodes, flexuous, angular, ascending at the tip, and as well as the petioles, nerves beneath, and peduncles, sparsely clothed with a substellate rusty pubescence. Leaves alternate, petioled, rather membranous, 4–5 in. by 2–2½ in., elliptic-oblong, acuminate, scarcely oblique, base rounded or slightly cordate, obscurely toothed at the tips of the few alternate nerves; petiole ¾–1½ in., rather slender; stipules ¾ in., subulate-lanceolate, ferruginous. Pedicels axillary, very short, 3–5-flowered at the top, very unequal, ¼–1¼ in., slender. Male fl.: Sepals 2, rose-red, oblong, obtuse, ⅓ in., hairy on the back. Petals linear. Anthers subunilateral, broadly oblong, obtusely apiculate; filaments connate into a short column. Female flower and fruit unknown.

Upper Guinea. Fernando Po, alt. 1000–2000 ft., on trees, *Mann!* Fl. Dec.

26. **B. loranthoides,** *Hook. f.* Glabrous except the young leaves beneath petioles and peduncles, which are covered with minute, membranous, fimbriate scales. Branches very stout, woody, nodose; bark smooth, spongy, covered with large raised circular scars. Leaves alternate, 3–4 in. by ¾–1¼ in., shortly petioled, very thick and fleshy, obliquely elliptic-lanceolate, acute at both ends, quite entire, wrinkled and when dry nerves very faint, alternate, petiole ¼–½ in.; stipule terminating the branchlet, convolute, ¾ in., ovate with a subulate recurved point. Peduncle short, axillary, slender compared with the branch, several-flowered; pedicels capillary, ⅓ in. Male fl.: Sepals 4, 2 outer ⅔ in. long, elliptic-oblong, obtuse, 2 inner shorter, narrow linear. Anthers 3, very small, linear-oblong, obtuse; filaments very short. Female flower and fruit unknown.

Upper Guinea. On trees, Prince's Island, *Barter!*

A most curious species: the scales are precisely like those of *B. squamulosa* and *elæagnifolia*.

ORDER LXVI. CACTACEÆ. (By Prof. Oliver.)

(TRIBE OPUNTIEÆ.)

Flowers hermaphrodite, regular. Calyx-tube adnate to the ovary, scarcely produced above it; lobes few many or reduced to minute teeth. Petals numerous (6–∞). Stamens indefinite, free or adnate to base of petals. Ovary inferior, 1-celled, style terminal simple, stigma radiately lobed; ovules indefinite parietal. Fruit baccate, many-seeded. (Seeds exalbuminous in *Rhipsalis*).—Herbs or shrubs of anomalous habit from succulence and varied dilatation of the stem (either columnar, globular or lobed), and usual suppression of the leaves. Flowers usually very handsome; minute in *Rhipsalis.*

A considerable Natural Order, with the following exception, exclusively American, although a few species of *Opuntieæ* are now naturalized in the Old World.

1. **RHIPSALIS,** Gært.; Benth. et Hook. f. Gen. Plant. i. 850.

Calyx-teeth very short, 3–∞. Petals 6–10, spreading oblong. Stamens 20 more or less. Ovary glabrous. Seeds exalbuminous.—Fleshy shrubs with elongate terete (angular or flattened) branches. Leaves squamiform. Flowers small, lateral, sessile.

The following species belongs to the section *Eurhipsalis*, characterized by small lateral whitish flowers, with glabrous ovary and pellucid pisiform berry.

1. **R. Cassytha,** *Gært.; DC. Prod.* iii. 476. Pendent shrub, reaching 4-9 ft. or more, from rocks and moss-grown trees; branches cylindrical, smooth, glaucescent, articulated at the insertion (either dichotomous or) approximately verticillate, occasionally rooting; in young plants, thinly clothed at first with deciduous tufted setæ. Flowers whitish, sessile, lateral, often numerous or crowded along the branches, $\frac{1}{6}$–$\frac{1}{4}$ in. diameter. Calyx-limb minute, unequally lobed. Petals 6–7, spreading. Stamens about 20. Stigma 4-partite with oblong obtuse fleshy somewhat spreading lobes. Berries pale yellowish-white; pulp viscous; seeds black shining.—Bot. Mag. 3080.

Upper Guinea. Prince's Island (very fragmentary), *Barter!*
Lower Guinea. Pungo Andongo and Golungo Alto, *Dr. Welwitsch!*
Mozamb. Distr. Moramballa (Zambesia, 3000–3500 ft.), *Dr. Kirk! Waller!*

Var.? *tenuior.* Branches very slender, simply repeatedly dichotomous, ovary (after flowering) cylindrical-oblong. Fernando Po, *Mann!* This form I think probably specifically distinct, but our material is small.

The above description is mainly from Dr. Welwitsch's full notes and excellent Angolan specimens.

Also in Ceylon, Mauritius, and Tropical America.

ORDER LXVII. FICOIDEÆ. (By Prof. Oliver.)

Flowers regular, usually hermaphrodite. Calyx polysepalous, sepals 4–5, imbricate, or gamosepalous 4–5-lobed, free or adnate more or less to the ovary; persistent. Petals 0 or minute and membranous or (in *Mesembryanthemum*) indefinite coloured. Stamens perigynous or in polysepalous genera hypogynous, definite or indefinite; filaments free or variously connate at base; anthers 2-celled, oblong elliptical or subdidymous, dehiscing longitudinally. Disk 0 or annulate. Ovary free (except in *Mesembryanthemum*), 1–2–∞-carpellary, syncarpous (except in *Gisekia*); styles or stigmas as many as cells of ovary; ovules solitary few or ∞. Fruit various; seed albuminous, albumen usually farinaceous; embryo curved or peripherical.—Herbs or low shrubs. Leaves opposite alternate or pseudo-verticillate, simple, often fleshy; stipules 0 or scarious. Flowers solitary or (usually) cymose.

A considerable Order of tropical and subtropical countries.

Ovary inferior.
Petals ∞. Capsule loculicidal . . . . . 1. MESEMBRYANTHEMUM.
Petals 0. Fruit indehiscent, a nut or drupaceous . . . 2. TETRAGONIA.

Ovary superior.
  Calyx gamosepalous.
    Dehiscence loculicidal.
      Stamens ∞. Ovules 2–∞ . . . . . 3. Aizoon.
      Stamens in pairs. Ovules solitary . . . . . 4. Galenia.
    Dehiscence circumsciss.
      Ovary 2–3–5-celled. Stamens ∞ . . . . . 5. Sesuvium.
      Ovary 1–2-celled . . . . . 6. Trianthema.
  Calyx polysepalous.
    Fruit capsular.
      Ovules and seeds ∞.
        Leaves cauline alternate (staminodia ∞) . . . . 7. Orygia.
        Leaves radical, rosulate, or cauline pseudo-verticillate (staminodia 0 or few) . . . . . 8. Mollugo.
        Leaves fleshy subterete (flowers umbellate) . . . 9. Pharnaceum.
      Ovules solitary . . . . . 10. Psammotropha.
    Fruit apocarpous; carpels 5 . . . . . 11. Gisekia.
    Fruit syncarpous, 2-coccous.
      Cocci broadly winged . . . . . 12. Semonvillea.
      Cocci not winged, smooth or tubercled . . . . . 13. Limeum.

1. **MESEMBRYANTHEMUM**, Linn.; Benth. et Hook. f. Gen. Plant. i. 853.

Calyx-tube adnate to the ovary; limb 5-(1–8-)lobed, usually unequal. Petals ∞, linear, inserted in the calyx-tube. Stamens ∞, multiseriate. Ovary inferior 5-(4–20-)celled; styles as many as cells, longitudinally stigmatose; ovules ∞. Capsule dehiscing loculicidally at the apex; seeds minute.—Herbs or frutescent, erect or procumbent, leafy, fleshy. Leaves usually opposite, simple, thick and fleshy, very various in form; exstipulate. Flowers conspicuous, white, yellow or rose.

A large genus, principally South African, with a few scattered members in Australasia and northwards to the Mediterranean.

Two forms, or perhaps two species of *Mesembryanthemum*, are in the Kew Herbarinm, collected by Schimper in Abyssinia, but I prefer at present not to attach names to them. They are both low herbs with branching woody stock and strongly papillose, trigonous, or cylindric-trigonous leaves. Flowers in one form distinctly pedunculate, with obviously unequal calyx-lobes (No. 1783 and part of 788); the other with subsessile flowers (No. 503). Richard also notices two species, which he does not describe at length nor name, collected by Petit (Fl. Abyss. i. 316), one papillose, the other not.

1. **M. dimorphum,** *Welw. mss.* (§ *Epapulosa*, probably section *Juncea*). Glaucous glabrous decumbent tortuous herb, at length, after 3 or 4 years, rigid pubescent with much reduced leaves, copiously flowering; decumbent branches terete, nearly the thickness of a goose-quill. Leaves opposite, subterete, 1st and 2nd year $\frac{3}{4}$–1 in. long, narrow-linear when dried; of older plants very narrow tortuous, $\frac{1}{3}$–$\frac{1}{2}$ in. Flowers small whitish terminating short unilateral leafy ramuli. Calyx-lobes subequal, rotundate or ovate, obtuse, nearly as long as petals. Styles 5. Capsule 5-valved.

Lower Guinea. Mossamedes, *Dr. Welwitsch!*

2. **M. dactylinum,** *Welw. mss.* (§ *Epapulosa, Calamiforme*). Small very succulent annual herb 1–3 in. high, simple or with a short forking

cylindrical stem. Leaves conico-cylindrical, turgid, obtuse (digitiform), smooth, reddish-brown, varying to 2 in. in length. Flowers white, solitary, nearly concealed between a pair of turgid ovoid concave obtuse erect bracts.

Lower Guinea. Mossamedes, *Dr. Welwitsch!* Described chiefly from Dr. Welwitsch's notes.

2. **TETRAGONIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 854.

Calyx-tube adnate to the ovary; lobes 3–5. Petals 0. Stamens ∞ (1–∞) inserted in the calyx-tube. Ovary nearly wholly inferior, 2–8-celled; styles thick, densely papillose; ovules solitary, pendulous. Fruit a nut or drupaceous (horned or) winged, indehiscent.—Herbs or low shrubs with alternate entire succulent exstipulate leaves. Flowers axillary, solitary or few together, sessile or pedunculate, greenish-yellow (or reddish).

Most of the species are peculiar to the Cape Flora. One (*T. expansa*, Murr.) of the Southern hemisphere and Japan is cultivated as spinach.

1. **T. reduplicata,** *Welw. mss.* Shrubby, erect with ascending early glabrous branches, 1½–2½ ft. high. Leaves alternate, succulent, ovate, strongly reduplicate along the midrib, the apex when thus folded more or less incurved or falcate, obtuse, glabrous or papillose, deep green when fresh; ½–1¼ in. long, varying to nearly 1 in. broad when forcibly flattened, rather abruptly narrowed into a petiole of ¼–½ in. Flowers greenish in short axillary fascicles or few-flowered racemules shorter than the leaf, about ⅓ in. broad. Calyx-lobes 4 (or 2), unequal, obtuse, spreading, papillose. Stamens 12–20. Styles 3 or 2, slightly exceeding the calyx. Fruit 4–3-winged, obovate or roundish in outline, ½–¾ in. long and broad, dull, nerveless between the wings, 2–1-celled by abortion (*Dr. Welwitsch*).

Lower Guinea. Mossamedes, Angola, *Dr. Welwitsch!*
Allied to *T. arbuscula*, F. of the Cape.

3. **AIZOON,** Linn.; Benth. et Hook. f. Gen. Plant. i. 854.

Calyx-tube short, limb 5–4-partite, segments imbricate (or valvate). Petals 0. Stamens indefinite, about 12–60, sometimes inserted in oligostemonous phalanges alternating with the calyx-lobes. Ovary free, depressed, 5–4-celled; styles free; ovules 2–∞ (6–10) in each cell. Capsule depressed, dehiscing loculicidally, the valves remaining affixed and incurved at the apex or free.—Herbs or suffrutescent, usually papillose-tomentose, the hairs often medio-fixed. Leaves alternate, exstipulate. Flowers axillary, solitary or in distichous spikes or contracted cymes.

A small genus of countries towards the Mediterranean, the Cape, and Australia.

Diffuse or prostrate, dichotomous. Flowers sessile, solitary in the forks or axils, or glomerate from contraction of internodes.
Valves of fruit inflexed, united to axis . . . . . 1. *A. canariense.*

Valves of fruit free . . . . . 2. *A. Mossamedense.*
Branches long flexuose virgate, silky. Flowers in contracted axillary cymes . . . . . 3. *A. virgatum.*

1. **A. canariense,** *Linn.; DC. Prod.* iii. 453. A diffuse or prostrate herb, branches often widely spreading, woody towards the crown, more or less uniformly cellular-pilose tomentose or papillose. Leaves obovate or elliptical narrowed into the petiole to spathulate obtuse, with the petiole $\frac{1}{2}$–2 in. (–3 in.) long. Flowers sessile in almost every fork or axil. Calyx-lobes ovate, acute, imbricate in æstivation. Fruit pentagonal-stelliform, $\frac{1}{5}$–$\frac{1}{3}$ in., valves inflexed, the apex attached to the column.

Nile Land. Nubia, Abyssinia, Arkiko, *Ehrenberg.* Dissée island, Red Sea, *Courbon.* Red Sea, 11–12° N. lat., *Lord!*
Extending from the Canaries eastward to Scinde; occurs also at the Cape.

2. **A. Mossamedense,** *Welw. mss.* Dichotomously branched, diffuse or erect, annual herb; stem in larger specimens, nearly as thick as a goose-quill, papillose-pubescent, from a few inches to 1 ft. or more. Leaves from oval to broadly elliptical, obtuse, distinctly petiolate, fleshy, cellular-papillose, $\frac{1}{2}$–1–1$\frac{1}{4}$ in. long, $\frac{1}{12}$–$\frac{1}{2}$ in. broad, petiole shorter than or sometimes nearly equalling the lamina. Flowers sessile, solitary in the forks, bright yellow, $\frac{1}{2}$ in. broad. Calyx-lobes ovate or ovate-lanceolate. Capsule 5-valved, valves free from the erect central column, recurved when wetted, the shining endocarp of each valve splitting longitudinally and easily separable. Seeds reniform, longitudinally ridged, ridges with very minute cross-striæ, as in *A. canariense.*

Lower Guinea. Mossamedes, *Dr. Welwitsch!*
Not identified with any described species.

3. **A. virgatum,** *Welw. mss.* Slender, shrubby, 2–3 ft. high with elongate, virgate or subsarmentose, silky-tomentose branches. Leaves alternate, oblanceolate or narrow-obovate, minutely apiculate, gradually narrowed into the petiole, entire, silky and at first silvery, with petiole 1–2 in. long, $\frac{1}{3}$ to over $\frac{1}{2}$ in. broad. Flowers $\frac{1}{4}$ in. diameter in much-contracted often many-flowered bracteate cymes from every axil, usually but little exceeding the petiole. Perianth silky-tomentose, lobes lanceolate or ovate-lanceolate acuminate, glabrous within. Stamens 50–60. Ovary 5–4-celled; styles radiate. Capsule obpyramidal, 5–4-valved, cells 1–2-seeded; seeds pendulous from the apex of the thickened central axis, estrophiolate but $\frac{1}{2}$ girt by the funicle. (Ovary and capsule, *Dr. Welwitsch.*)

Lower Guinea. Mossamedes, Angola, *Dr. Welwitsch!*
Not recognised from elsewhere.

4. **GALENIA,** Linn.; Benth. et Hook. f. Gen. Plant. i. 854.

Calyx 4–5-fid. Petals 0. Stamens normally twice as many as calyx-lobes, inserted in pairs alternate with the lobes. Ovary free,

2–5-celled; styles as many as cells, distinct, divaricate, papillose; ovules solitary (or in pairs). Capsule membranous, dehiscing loculicidally in as many valves as cells.—Herbs or low shrubs, glabrous papillose tomentose or scaly. Leaves alternate or opposite, entire, veinless, exstipulate. Flowers small, sessile or pedicellate, axillary or in paniculate cymes.

A genus of 15–20 species, confined to the Cape, with the following exception.

1. **G. africana,** *Linn. Sp. Pl.* 515. *Var.* An erect or diffuse divaricately rigidly branched glabrous or minutely papillose shrub, reaching 1–2 ft. Leaves opposite and often fascicled in the axils, narrowly oval or oblanceolate, apex often folded and reflexed, narrowed below into the petiole; with petiole $\frac{1}{2}$–$1\frac{1}{2}$ in. long, $\frac{1}{10}$–$\frac{1}{4}$ in. broad. Flowers about 1 line broad, sessile in terminal divaricate dichotomous paniculate bracteate cymes. Bracteoles fleshy, at base of perianth. Perianth-lobes 4, outer ovate-oblong, thickened dorsally at apex. Styles 2, divaricate.

Lower Guinea. Mossamedes, Benguela, *Dr. Welwitsch!*

With rather broader leaves than the common Cape form of this species; but Dr. Sonder (Flora Capensis, ii. 478) describes a var. *halimifolia*, which is probably identical.

5. **SESUVIUM,** Linn.; Benth. et Hook. f. Gen. Plant. i. 855.

Calyx-tube turbinate, short, lobes 5. Petals 0. Stamens (5 or) ∞, inserted in mouth of calyx-tube, free or filaments connate at base. Ovary free, 2–3–5-celled; styles free or nearly so, as many as cells. Capsule membranous, 3–5-celled, circumsciss; seeds few or many, rotundate-reniform, compressed, funiculate; embryo annulate.—Herbs or low shrubs, erect or prostrate, branching, succulent. Leaves opposite, fleshy, usually narrow, exstipulate; petioles sometimes membranous-margined, sheathing. Flowers axillary, sessile or pedunculate, solitary or variously arranged, usually coloured.

A small littoral genus, generally diffused in the Tropics.

Styles 3–5.
- Glabrous. Leaves linear-spathulate to obovate . . . . . 1. *S. Portulacastrum.*
- Distinctly papillosé or vesicular.
  - Leaves linear revolute . . . . . 2. *S. congense.*
  - Leaves terete, 1-furrowed above . . . . . 3. *S. crystallinum.*

Styles 2. Leaves oval or linear . . . . . 4. *S. digynum.*

1. **S. Portulacastrum,** *Linn.; DC. Prod.* iii. 453. A diffuse procumbent or prostrate and rooting succulent glabrous herb often wholly blood-red or purple. Leaves succulent, from linear slightly dilated upwards to oblanceolate or obovate-oblong, much narrowed at base, usually from $\frac{1}{2}$–2 in. in length; petioles sheathing, more or less membranous-margined. Flowers axillary, purplish or rose, usually on peduncles equalling or shorter rarely much longer than the flower. Calyx deeply 5-lobed, lobes ovate-lanceolate, obtuse with a mucro just below the apex behind. Stamens indefinite, free or nearly so. Ovary

usually 3-celled. Seeds black, shining, nearly smooth.—*S. brevifolium*, Schum. et Thonn. Pl. Guin. 233.

Upper Guinea. Senegambia, *Sieber and others!*

Lower Guinea. Ambriz, Congo, Mossamedes, and Loanda, *Dr. Welwitsch!* Var., with large sessile flowers and narrow linear leaves, 2–3 in. long (*S. mesembryanthemoides*, Welw. in Apont. Phyto-geogr. 557, Wawra et Peyritsch, Sert. Beng. 24). Loanda, *Dr. Welwitsch!*

Mozamb. Distr. Mouth of Zambesi and Luabo, *Dr. Kirk!*

Gathered as an esculent. Common on Tropical shores of both hemispheres.

Sesuvium crithmoides, Welw. in Apont. Phyto-geogr. 586, Dr. Welwitsch believes to be a form of his *S. mesembryanthemoides;* his specimens were accidentally lost.

2. **S. congense,** *Welw. mss.* Shrubby, prostrate or diffuse, much branched from the base; branches tortuous, terete, minutely scabrid-papillose. Leaves fleshy, often tufted in the axils, linear, revolute, $\frac{1}{4}$–1 in. long. Flowers small, subsessile, rose-coloured, solitary in the axils or forks, overtopped by the leaves. Calyx-lobes ovate-lanceolate, shortly apiculate under the apex, inner broader, membrane-margined. Stamens all or nearly all monstrous in the specimens examined (developing as free carpels), indefinite or about 20. Ovary 3-celled, styles as many. Operculum of capsule conical.

Lower Guinea. Ambriz, Congo, *Dr. Welwitsch!*

3. **S. crystallinum,** *Welw. mss.* Diffuse or prostrate herb, sometimes forming large tufted masses, vesicular-papillose throughout as in the Ice-plant (*Mesembryanthemum crystallinum*); branches alternately forked. Leaves terete, furrowed above, obtuse, $\frac{3}{4}$–2 in. long, $\frac{1}{7}$–$\frac{1}{4}$ in. diameter when dry, base dilated, sheathing. Flowers rose-coloured, solitary in each fork or somewhat glomerate at the extremities from the contracted internodes, sessile, $\frac{1}{2}$–$\frac{3}{4}$ in. long. Calyx-lobes ovate-deltoid, inner membrane-margined; tube hemispherical dilated below the lobes, and more or less obtusely cornute outside alternate with the lobes. Stamens ∞; filaments hyaline, free. Ovary globose, glabrous, 4-celled; styles 4, as long as ovary. Seeds black, shining, minutely punctate.

Lower Guinea. Mossamedes, Benguela, sea-shore, *Dr. Welwitsch!*

4. **S. digynum,** *Welw. mss.* A diffuse dichotomously and divaricately branched annual or biennial herb occasionally subscandent amongst surrounding shrubs, glabrous or papillose-puberulous. Leaves from oval to linear, narrowed above and below, more or less acute, plane or margins revolute, $\frac{1}{2}$–1 in. long, from $\frac{1}{12}$ in. in the narrow revolute-leaved forms to $\frac{1}{2}$ in. broad. Flowers rose or purple, solitary, sessile in each fork, $\frac{1}{3}$–$\frac{1}{2}$ in. long. Calyx-tube turbinate, lobes with a conspicuous subapical terete apiculus terminating in a minute "gland." Stamens ∞. Ovary 2-celled; styles 2, filiform. Ovules ∞, distinctly funiculate.—*Diplochonium sesuvioides*, Wawr. et Peyr. Sert. Beng. 24, and probably of Fenzl in Monogr. Mollug. (Extr.) 292 (*adnot.*).

Lower Guinea. Mossamedes, (and narrow revolute-leaved var.) Benguela, *Dr. Welwitsch! Dr. Wawra.*

6. TRIANTHEMA, Linn.; Benth. et Hook. f. Gen. Plant. i. 855.

Calyx 5-fid, lobes with a dorsal subapical cusp. Petals 0. Stamens 3–5–10 or ∞, perigynous, when definite alternating with the calyx-lobes. Ovary free, usually obtuse, truncate or umbilicate at apex, 1–2-celled; styles 2 or 1; ovules solitary or ∞, from a 'basilar placenta.' Capsule membranous or coriaceous, 1–2-celled, 1–2– ∞-seeded, circumsciss. Seeds rotundate-reniform, compressed, often plicate-rugose, black; embryo annulate.—Herbs or undershrubs, glabrous or papillose. Leaves opposite, unequal, entire, linear to rotundate, often fleshy; petiole dilated with membranous stipuliform margins. Flowers axillary, solitary or fascicled in Trop. African species.

A small Old World genus, widely spread in warm regions.

Style 1.
  Flowers solitary.
    Stamens 10 or more. Leaves obovate or rotundate . . . 1. *T. monogyna.*
  Flowers in glomerules.
    Calyces free (not consolidated).
      Leaves oblanceolate to rotundate . . . . . 2. *T. crystallina.*
      Leaves linear . . . . . 3. *T. sedifolia.*
    Calyces consolidated below. Leaves linear . . . . . 4. *T. salsoloides.*
Styles 2.
  Flowers solitary . . . . . 5. *T. polyspermum.*
  Flowers in glomerules . . . . . 6. *T. pentandra.*

1. **T. monogyna,** *L. Mant.* 69. Diffuse prostrate or seedlings ascending, branches flexuose, alternate, distichous, more or less ancipitous; wholly glabrous. Leaves rather fleshy, obovate or obovate-rotundate, entire or emarginate, sometimes mucronate, usually ½–1 in. long; petiole distinct, ⅙–½ in., one leaf of each pair alternately much smaller. Flowers solitary, sessile, sheathed by the stipuliform membranous base of the petioles. Perianth-lobes obtuse, with a dorsal subapical awn or apiculus. Stamens 10–12 (or more). Ovary truncate above; style 1. Seeds few, plicate-rugose.—DC. Prod. iii. 352; *T. obcordata,* Roxb. Fl. Ind. ii. 445; *T. flexuosa,* S. et T. Pl. Guin. 221.

Upper Guinea. Cape Coast, *T. Vogel!* Christiansburg, *Thonning.*
Also in Tropical America and Asia.

2. **T. crystallina,** *V.*; *DC. Prod.* iii. 352. Ascending or diffuse with spreading or prostrate branches, repeatedly 2–3-chotomous from the base, annual or biennial; branches, at least towards the extremities, and leaves cellular-papillose. Leaves fleshy, oblanceolate obovate or rotundate, obtuse, usually cuneately narrowed into the petiole, much reduced and often roundish and subcordate on profusely flowering branches; ¼–¾ in. long, petiole usually distinct, short, sheathing. Flowers in axillary few- or many-flowered often dense fascicles. Calyx 5-fid, lobes equalling tube, ovate or deltoid with a lanceolate or short and obtuse dorsal apiculus. Stamens 5. Ovary truncate, 1-celled; style 1, equalling ovary. Seeds 2, plicate-rugose.

Nile Land. Widely spread in different provinces.

Lower Guinea. Mossamedes, *Dr. Welwitsch!*
Also in Tropical Asia and Australia. Chapman and Baines collected an imperfect specimen of a *Trianthema* near *T. crystallina*, but perhaps distinct, in lat. 23° S.

3. **T. sedifolia,** *Visiani, Pl. Æg. ac Nub.* 19, *t.* iii. *fig.* 1. Procumbent or prostrate with slender papillose alternate or more rarely opposite distichous branches. Leaves fleshy, nearly linear, more or less revolute, obtuse, $\frac{1}{3}$–$\frac{1}{2}$ in. long, $\frac{1}{2}$ in. broad; short petiole membranously dilated. Flowers in sessile axillary glomerules of 2–3 or more. Calyx campanulate, 5-fid, lobes ovate-deltoid, somewhat fleshy or apiculate behind towards the apex. Stamens 3 or 5. Ovary turbinate, umbilicate; style 1, very short. Seeds 2, superposed.

Nile Land. Various provinces. Kordofan, *Kotschy!* Sennaar, *Brocchi.*
Lower Guinea. Mossamedes (form with acutely apiculate calyx-lobes), *Dr. Welwitsch!*

4. **T. salsoloides,** *Fenzl in Herb. Kotschy. Nub.* 137. Branches dichotomous, papillose. Leaves linear, fleshy, mucronate, dilated at base with membranous stipuliform teeth; $\frac{1}{2}$–1 in. long, $\frac{1}{12}$–$\frac{1}{10}$ in. broad. Flowers in axillary fascicles or on short lateral leafy shoots, the calyces consolidated below. Calyx-teeth with apiculus, lanceolate acute. Stamens 5 or fewer (?). Style 1, short. Capsule 1-seeded.

Nile Land. Kordofan, *Kotschy!* Nubia.

5. **T. polysperma,** *Hochst. in Herb. Nub. Kotschy*, 68. Branches dichotomous, cellular-papillose. Leaves fleshy, oval or oblanceolate, obtuse, younger revolute, narrowed into the petiole, about $\frac{3}{4}$ in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad; petiole half as long as lamina or shorter. Flowers solitary, sessile in the axils. Calyx-tube turbinate with minute cornua alternating outside with the dorsally appendiculate lobes. Stamens apparently about 7. Ovary 2-celled; styles 2, short. Capsule narrowed above, apex obtuse or umbilicate. Seeds indefinite.

Nile Land. Kordofan, *Kotschy!*

6. **T. pentandra,** *Linn.; DC. Prod.* iii. 352. Diffuse, from a few inches to 2–3 ft. in height, papillose more or less throughout, often obscurely so or nearly smooth and glabrous when dry. Leaves oval-oblong to obovate-elliptical, obtuse, broadly pointed, distinctly petiolate; usually from $\frac{1}{2}$–2 in. long, petiole $\frac{1}{6}$–$\frac{1}{2}$ in. Flowers in few- or many-flowered sessile or subsessile axillary fascicles; bracteoles thinly membranous. Calyx deeply 5-fid, lobes ovate to obovate-oblong, with a more or less distinct dorsal apiculus beneath the apex. Stamens 5. Ovary turbinate above, 2-celled; styles 2, equalling the ovary; ovules geminate (or few).

Upper Guinea. Sierra Leone, *Afzelius!* Borgu, *Barter!* Senegambia, *Roger!*
North Central. Kouka, Lake Tsad, *Dr. E. Vogel!*
Nile Land. Generally diffused, especially in Nubia, Sennaar, and Kordofan.
Occurs in N. W. India.

7. **ORYGIA,** Forsk.; Benth. et Hook. f. Gen. Plant. i. 856.

Calyx 5-sepalous, sepals ovate cuspidate with narrow pale membranous margins. Petals 0. Staminodia ∞, subhypogynous, very narrow, deliquescent. Stamens 12 or more, subhypogynous, free or obscurely coherent at base. Ovary free, globose, 5-sulcate, 5-celled; styles 5; ovules ∞, axile. Capsule dehiscing loculicidally in 5 valves, each remaining attached below to its septum; seeds ∞, reniform, concentrically granular-striate, minutely strophiolate.—Rigid or somewhat wiry herb, woody at the crown; wholly glabrous; branches diffuse, angular. Leaves alternate, obovate- or rotundate-cuneate, apiculate, entire, rather fleshy, pale or glaucous, petiolate, exstipulate. Flowers in terminal or lateral and leaf-opposed racemose lax cymes; pedicels equalling or shorter than the calyx.

A monotypic genus of the Old World Tropics.

1. **O. decumbens,** *Forsk.; DC. Prod.* iii. 455. Decumbent, diffuse, from a few inches to 1–2 ft. in height. Leaves ½–1 in. in breadth, occasionally smaller; radical leaves sometimes 1–1¼ in. Flowers about ⅓ in. diameter.—*O. mucronata,* Klotzsch in Peters' Mossamb. Bot. 140 t. (*Glinus*) 25. Schweinf. Fl. Æthiop. 61.

Nile Land. Abyssinia, *Schimper!* Nubia, *Schweinfurth!* Dissée, *Courbon.*
Lower Guinea. Mossamedes, *Dr. Welwitsch!*
Mozamb. Distr. On the Zambesi, *Dr. Kirk! Dr. Peters.*
Also at the Cape, and Eastward to India.

8. **MOLLUGO,** Linn.; Benth. et Hook. f. Gen. Plant. i. 857.

Sepals 5, nearly equal, persistent. Petals 0. Stamens hypogynous or nearly so, 3–5–∞, with or without linear or filiform staminodes. Ovary free, 3–5-celled; stigmas as many, sessile or style very short; ovules ∞, axile. Capsule loculicidally 3–5-valved, ∞-spermous; seeds subreniform, compressed, usually minutely tubercled, with or without strophiole and funicle.—Erect or diffuse, glabrous or tomentose, often annual herbs. Radical leaves rosulate, cauline pseudo-verticillate, unequal. Stipules 0 or fugacious. Flowers axillary, fascicled or in diffuse or umbelliform cymes.

A small Tropical and subtropical genus. But one of the following is endemic. *M. Pauli-Wilhelmi,* Schweinfurth, Fl. Æthiop. (Aufzähl.), 267, I have not seen any description of.

Seeds appendaged. Flowers fascicled at the nodes (*Glinus*).
  Tomentose (rarely glabrate). Pedicels shorter than flowers or 0 — 1. *M. Glinus.*
  Glabrous or glabrescent. Pedicels 1–5 times calyx.
    Flowers ¼ in. Stamens 20–30 . . . . . — 2. *M. Bainesii.*
    Flowers ⅛ in. or less. Stamens 5–10 . . . . . — 3. *M. Spergula.*
Seeds wholly unappendaged. Flowers in sessile or pedunculate lateral umbels or in forked or umbelliform cymes (*Eumollugo*).
  Leaves all radical, oblanceolate. Scapes 2–3-chotomous . . . — 4. *M. nudicaulis.*

Leaves cauline, radical usually evanescent.	
Cauline leaves linear.	
Umbels pedunculate or sessile, often confluent in a general diffuse inflorescence. Stigmas sessile, minute	5. *M. Cerviana.*
Umbels sessile at each node. Styles $\frac{1}{3}$–$\frac{1}{2}$ as long as ovary	6. *M. verticillata*, var.
Cauline leaves oblong-spathulate. Umbels shortly pedunculate at each node	7. *M. fragilis.*

1. **M. Glinus,** *A. Rich. Fl. Abyss.* i. 48. Diffuse or ascending annual herb, more or less often densely tomentose or villous with chiefly stellate hairs; branches extending from a few inches to 1–2 ft., dichotomous. Leaves from rotundate with cuneate base to obovate or oblanceolate, apex rounded or broadly pointed, obsoletely denticulate or entire; lamina 1 in. long or less, narrowed into the petiole which is shorter than or rarely equalling the lamina. Flowers usually in rather close axillary fascicles; pedicels shorter than calyx. Stamens ∞ or varying to 5, with a few filamentous staminodes. Stigmas 2–5; style very short. Seeds with a conspicuous vesicular strophiole sometimes about as large as the tubercled seed and a straight or involute slender white funiculiform process.—*Glinus lotoides*, Lœfl.; Fenzl, Mollugin. (Extr.) 357. There are two principal forms which may be specifically distinct, viz., 1. Stem and leaves hoary-tomentose; sepals $\frac{1}{4}$–$\frac{1}{3}$ in. long. 2 (Var. *virens*, Fenzl), less tomentose, leaves sometimes green and glabrate; sepals $\frac{1}{6}$ in.

Upper Guinea. Senegambia, *Roger!* Niger, *Barter!*
Nile Land. Abyssinia, *Schimper!* White Nile, *Consul Petherick!*
Lower Guinea. Congo, *C. Smith!* Loanda, Mossamedes, &c. Angola. var. *virens*, a single specimen, Pungo Andongo, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi, *Dr. Peters!*
Widely spread from South Europe and North Africa eastward to India and Australia; occurring also in America.

2. **M. Bainesii,** *Oliv.* Glabrous, dichotomous. Leaves in pseudo-verticils, unequal narrow- or linear-oval acute, green, rather fleshy, gradually narrowed into the petiole, under 1 in. long, $\frac{1}{6}$–$\frac{1}{5}$ in. broad. Flowers in axillary fascicles of 3–9, pedicellate; pedicels 1–4 times longer than flowers. Sepals $\frac{1}{4}$ in. long.

South Central. "Koobie to N. Shaw Valley," *T. Baines!*

3. **M. Spergula,** *Linn.; DC. Prod.* i. 391. Diffuse decumbent or ascending dichotomously branched herb, glabrous or extremities cellular-pubescent. Leaves veinless, rather fleshy, in pseudo-verticils of 3–9, unequal, oblanceolate oval or linear-lanceolate, obtuse or acute, entire or obsoletely denticulate at first, $\frac{1}{3}$–1 in. long, narrowed into the petiole. Flowers in axillary fascicles of 2 or more, or subsolitary; pedicels 1–5 times longer than calyx, slender, reflexed after flowering. Sepals oblong or obovate, concave, glabrous, membranous-margined, ascending, $\frac{1}{6}$ in. or less long. Stamens 5–6–10. Ovary oblong-ellipsoidal, 3-gonous. Stigmas 3, minute, sessile or subsessile. Seeds granulate, minutely strophiolate; funicle filiform involute.—*M. glinoides*, Rich. Fl. Abyss. i.

48. *M. verticillata* and *M. denticulata*, Guill. et Perr. Fl. Seneg. i. 45. *Glinus Mollugo*, Fenzl, Mollugin. (Extr.) 359; *Glinus denticulatus*, Fenzl, l. c.

Upper Guinea. Senegambia! Abbeokuta, *Irving!* Nupe, *Barter!* Sierra Leone, *Afzelius!*
Nile Land. Abyssinia, *Dillon;* Nubia.
Lower Guinea. Congo, *Smith!* A fine series from various provinces of Angola, *Dr. Welwitsch!*
Mozamb. Distr. Zambesi, *Dr. Kirk!* and others.
Grows in Tropical Asia and Australia.

4. **M. nudicaulis,** *Lam.; DC. Prod.* i. 391. Glabrous annual of 4–10 in., with numerous strict 2–3-chotomous scapiform stems from the rosulate oblanceolate or obovate-spathulate radical leaves of 1–2½ in. in length. Bracts at each node minute. Flowers ⅙ in. expanded, in repeatedly forking often lax cymes. Pedicels erect capillary. Sepals obovate-elliptical. Stamens 5–3. Capsule 3-valved. Stigmas minute. Seeds granulate, very minutely strophiolate.—*M. bellidifolia*, Ser. in DC. Prod. i. 391; Fenzl, Mollugin. (Extr.), 382.

Upper Guinea. Senegambia, *Sieber!* and others. Nigritania, *T. Vogel! Barter!*
Nile Land. Abyssinia, *Schimper!* Nubia, *Kotschy!* Kordofan, *Cienkowski.*
Lower Guinea. Congo, *Smith!* Ambriz, Congo, and Cazengo, *Dr. Welwitsch!*
Mozamb. Distr. Rovuma river, *Dr. Kirk!* Zambesi, *Dr. Peters.* Prov. Zanzibar, *Speke and Grant!*

5. **M. Cerviana,** *Seringe; DC. Prod.* i. 392. Annual glabrous glaucous herb of 2–6 in., branches very slender, often numerous, strict, erect or diffuse from the crown. Radical leaves spathulate or linear-spathulate rosulate, mostly withered at flowering, ¼–¾ in. long; cauline pseudo-verticillate unequal linear obtuse or mucronate. Peduncles filiform, 3-chotomous or umbellate-cymose; flowers 1½–2 lines diameter, usually shorter than the erect or divaricate capillary usually umbelled pedicels. Sepals obovate-elliptical, obtuse, broadly membranous-margined. Stamens 5. Stigmas minute. Capsule 3-valved. Seeds estrophiolate.—Fenzl, Mollugin. (Extr.) 379; *M. umbellata*, Ser., DC. l.c. 393; *Pharmaceum umbellatum*, Forsk. Fl. Ægypt. 58 (*fide Fenzl*).

Upper Guinea. Senegambia, *Hussenot!* and others. Nupe, Niger, *Barter!*
Nile Land. Abyssinia, *Schimper!* Kordofan, *Kotschy!*
Lower Guinea. Various provinces of Angola, *Dr. Welwitsch!*
Mozamb. Distr. Shupanga, *Dr. Kirk! Dr. Peters.* Zungomera, Zanzibar, *Speke and Grant!*
Also in South Europe, Asia, Australia, and at the Cape.
Mollugo umbellata, Herb. Schweinfurth, is *Polycarpæa spicata*, Arn.

6. **M. verticillata,** *Linn.; DC. Prod.* i. 391; var. *linearis, Fenzl, Mollug.* 377, (*Extr.*). Erect or diffuse repeatedly branching annual herb, wholly glabrous; branches slender, internodes straight, subrigid. Radical leaves rosulate spathulate evanescent, cauline pseudo-verticillate narrow-linear, acute, attenuate below; ⅓–1 in. long. Flowers in sessile 3–7- (12)-flowered umbels at the nodes, about $\frac{1}{12}$ in., pedicels 3–4 times longer than fruit. Sepals with white membranous margins,

equalling the capsule. "Stamens 3–4." Styles 3, shortly distinctly exserted. Stigmas capitellate. Seeds unappendaged, reniform, compressed, with very minutely transversely notched longitudinal ridges.—*M. Schrankii*, Ser. in DC. Prod. i. 391. Further synonymy, see Fenzl, l. c.

Lower Guinea. Loanda, Angola, *Dr Welwitsch!*
Also American, chiefly intertropical.

7. **M. fragilis,** *Wawr. et Peyr. Sert. Beng.* 25. Diffuse or prostrate (not erect as described by W. and P.), much-branched perennial or biennial wholly glabrous glaucous or pruinose herb, from a few inches to 1 ft. in height; branches filiform with internodes usually of $\frac{1}{2}$–1 in. Leaves pseudo-verticillate oblanceolate or oblong-spathulate, obtuse, entire, averaging $\frac{1}{4}$–$\frac{1}{3}$ in. in length. Flowers in usually 3–4-flowered pedunculate umbels from nearly every node; peduncle and pedicels filiform, subequal, $\frac{1}{4}$–$\frac{1}{3}$ in., involucel minute. Sepals obovate, broadly white membrane-margined. Stamens 5. Stigmas 3–4, minute subsessile. Seeds unappendaged, nearly quite smooth.

Lower Guinea. Loanda and Ambriz, Congo, *Dr. Welwitsch!*

9. PHARNACEUM, Linn.; Benth. et Hook. f. Gen. Plant. i. 857.

Sepals 5, nearly equal, membranous-margined, persistent. Petals 0. Stamens 5–10 (3–∞), subhypogynous. Disk lobed or 0. Ovary free, 3–5-celled; stigmas as many as cells, short; ovules ∞, axile. Capsule membranous, 3–5-celled, loculicidally 3–5-valved; seeds smooth, shining or minutely granulate, unappendaged.—Annual or perennial low herbs, often frutescent at base. Leaves alternate or pseudo-verticillate, fleshy, terete (or various), stipulate; stipules scarious, setaceous-fimbriate or leaf-sheath with a subulate tooth on each side. Flowers in pedunculate umbels (or variously cymose).

Almost exclusively confined to the Cape of Good Hope. The following species is nearly allied to *P. acidum*, Hook. f., of St. Helena.

1. **P. verrucosum,** *E. et Z. Enum.* 286. *Var.* Low herb, with procumbent or prostrate woody branching stock, wholly glabrous; annual or persisting two or more years. Leaves crowded at the extremities, ascending, subterete, $\frac{1}{2}$–1 in. long, $\frac{1}{12}$ in. diameter more or less when dry, with a stipuliform tooth at each side of the sheathing base. Flowers $\frac{1}{4}$ in. diameter, more or less, in pedunculate umbels; peduncles usually naked, occasionally verrucose, $1\frac{1}{2}$–3 in. long; involucral bracts minute, ovate, membranous; pedicels slender, straight, 3–6 to each umbel, $\frac{1}{3}$–$\frac{3}{4}$ in. long. Sepals broadly elliptical obtuse, sometimes with the pedicels minutely verrucose. Stamens usually 7, varying 1–5 or 7–9 (*Dr. Welwitsch*).—*Hypertelis verrucosa*, Fenzl, Monog. Mollug. 262 (*Extr.*).

Lower Guinea. Near Mossamedes, Benguela, *Dr. Welwitsch!*
And at the Cape.

10. PSAMMOTROPHA, E. et Z.; Benth. et Hook. f. Gen. Plant. i. 858.

Flowers minute, hermaphrodite. Sepals 5, midrib herbaceous, broadly white-margined. Petals 0. Stamens 5. Ovary 3–5-gonous, 3–5-celled; styles connate below or free, as many as cells; "ovules solitary, ascending." Capsule subglobose, 3–5-gonous, loculicidally 5-valved; cells 1-seeded, seeds globose granulate.—Perennial somewhat rigid herbs, with a dense tuft of linear radical leaves and decumbent slender branches, with pseudo-verticillate leaves at the nodes. Stipules 0. Flowers greenish, in small glomerules at the nodes, sessile or pedicellate.

A small genus, exclusively Cape, with this exception.

1. **P. myriantha,** *Sond. in Harv. et Sond. Fl. Cap.* i. 147; var. *huillensis, Welw. mss.* Persistent stem much thickened, wholly concealed by the densely tufted, narrow-linear 1-nerved glabrous, shortly aristate radical leaves, 1 in. long more or less. Flowering branches decumbent or ascending, 6–15 in. long, numerous in older specimens, glabrous, often reddish, with the lower internodes 1–2 in. Cauline leaves linear, rather fleshy, glaucous or pruinose, with or without a short awn, $\frac{1}{4}$–$\frac{1}{3}$ in. long. Flowers $\frac{1}{10}$–$\frac{1}{8}$ in. diameter in 3–5-flowered sessile umbels from all the upper nodes, forming an interrupted leafy spiciform inflorescence; pedicels equalling the flower. Styles 5, united below, at length radiate-divaricate above.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

Also south of the Tropic, where the radical leaves reach twice the length, and the plant would seem more erect in habit.

11. GISEKIA, Linn.; Benth. et Hook. f. Gen. Plant. i. 859.

Flowers hermaphrodite or occasionally polygamous. Sepals normally 5, equal, broadly elliptical obovate or rotundate. Petals 0. Stamens 5–15, hypogynous, free or cohering shortly in phalanges. Carpels usually 5, distinct, sessile, 1-celled, 1-ovulate; style short, recurved, longitudinally stigmatose. Achenes with a thin papillose-tubercled pericarp; seed vertical, more or less compressed.—Diffuse annual herbs. Leaves subopposite, rather fleshy, linear to oblanceolate, entire, abounding in raphidian cells; exstipulate. Flowers small, subsessile or pedicellate in sessile fascicles at the nodes or pedunculate umbels.

A small genus of Africa, India, and intermediate region.

Flowers 5-androus.
- Cymes usually nearly sessile at the nodes; pedicels short . 1. *G. pharnaceoides.*
- Cymes on slender peduncles, at length panicled . . . . 2. *G. rubella.*

Flowers 8–20-androus . . . . . 3. *G. Miltus.*

1. **G. pharnaceoides,** *Linn.; DC. Prod.* xiii. *pt.* 2, 27. A diffuse decumbent or prostrate annual, wholly glabrous, with slender dichoto-

mous flexuose branches from a few inches to 1–2 ft. in length. Leaves mostly nearly opposite, linear oval or elliptic-oblanceolate, obtuse or subacute, entire, narrowed to the petiole, rather fleshy; lamina varying from $\frac{1}{3}$ to 2 in. in length. Cymes umbelliform, usually sessile or subsessile at the nodes and shorter than the leaves, often many-flowered; pedicels usually 1–4 times as long as the flower. Flowers 1 line long. Stamens 5. Carpels normally 5.

Upper Guinea. Senegambia (*β. Sieberi*, Moq.), *Sieber!* Niger, *Barter!* var. *pedunculata*, peduncles $\frac{1}{2}$–1 in.; (*G. linearifolia*, Schum. et Thonn. Pl. Guin. 167). Guinea, *Thonning*. var. *congesta* (*G. congesta*, Moq. in DC. Prod. l.c. 28), cymes pedunculate, subcapitate, Senegambia!

Nile Land. Abyssinia, *Ehrenberg!* Kordofan, *Kotschy!* and other provinces.

Lower Guinea. Congo, *Smith!* Loanda and Pungo Andongo; var. *congesta*, Ambriz and Mossamedes (a remarkably fine series), *Dr. Welwitsch!*

Also south of the Tropic and Eastward to India.

2. **G. rubella,** *Hochst.*; *DC. Prod.* xiii. *pt.* 2, 27. All the general characters of *G. pharnaceoides*; ascending, leaves linear or linear-oval, $1\frac{1}{2}$–2 in. long. Cymes umbelliform, at length pedunculate, forming lax diffuse panicles; peduncles 2 in. or shorter, very slender; pedicels $\frac{1}{4}$–$\frac{1}{2}$ in. Flowers as in *G. pharnaceoides*, of which it may be a variety.—*G. linearifolia*, Fenzl in Kotschy, Pl. Æthiop. (*fide Moquin*).

Nile Land. Abyssinia, *Schimper!* Kordofan, *Kotschy!*

3. **G. Miltus,** *Fenzl; DC. Prod.* xiii. *pt.* 2, 28. Annual, wholly glabrous, forming sometimes a woody stock, in habit resembling *G. pharnaceoides*, with long slender diffuse forking branches. Leaves of *G. pharnaceoides*. Cymes usually many-flowered, and sessile at the nodes; pedicels 1–4 times longer than flowers. Perfect flowers with from about 10–15 stamens; filaments very shortly cohering in phalanges at base. Carpels normally 5. Staminate flowers (small and later?) with about 15 stamens; pistillate with 12–15 carpels. Fruit as in *G. pharnaceoides*.—*Miltus africana*, Lour. Fl. Coch. 302. *Glinus mozambicensis*, Spreng. Syst. ii. 467.

Lower Guinea. Pungo Andongo, *Dr. Welwitsch!*

Mozamb. Distr. Mozambique, Loureiro, *Forbes!* Luabo and Mouth of Zambesi, *Dr. Kirk!*

Var. *pedunculata* (*G. aspera*, Klotzsch in Peters' Mossamb. Bot. 136), cymes pedunculate; near Mossamedes, *Dr. Welwitsch!* also Tette, Zambesi, *Dr. Kirk!*

Probably identical with *G. pentadecandra*, E Mey., of the Cape Flora. The leaves are as long as in *G. pharnaceoides*, not 1–4 lines as misquoted by Moquin. Dr. Wawra gathered *G. pentadecandra*, E. M., near Benguela, according to "Sertum Benguelense," 23.

12. **SEMONVILLEA,** Gay; Benth. et Hook. f. Gen. Plant. i. 859.

Flowers hermaphrodite. Sepals 5, nearly equal, ovate or elliptical, with broad membranous margins. Petals 0 (in *S. pterocarpa*). Stamens 6–7, hypogynous. Ovary free, 2-celled; styles 2, very short, stigmatose; ovules solitary. Fruit orbicular, dorsally compressed, separating in two, broadly winged, 1-seeded cocci; seed erect; embryo annular.

—Annual erect or diffuse glabrous herbs. Leaves alternate, linear, rather fleshy, exstipulate. Flowers small, greenish, in small pedunculate subcapitate (or forked and unilateral) cymes.

The following species is peculiar to this Flora; a second species is found at the Cape.

1. **S. pterocarpa,** *J. Gay; DC. Prod.* xiii. *pt.* 2, 19. Erect glabrous glaucous repeatedly branched herb of 1–2½ ft. Leaves linear, subacute, 1–2 in. long, 1–2½ lines broad. Cymes 10–12-flowered, terminal and leaf-opposed, pedunculate; pedicels very short, bracteolate. Stamens 6–7. Fruit-carpels much compressed, orbicular, 4–5 lines diameter, each with a basal sinus in the broad radiately-nerved entire marginal wing.—*S. punctuta,* Steud.

Upper Guinea. Senegambia (fl. Aug. and Sept.), *Roger! Leprieur!*
Nile Land. Kordofan, *Cienkowski.*

13. LIMEUM, Linn.; Benth. et Hook. f. Gen. Plant. i. 859.

Flowers hermaphrodite (or unisexual). Sepals 5, nearly equal, herbaceous or with broad membranous margins. Petals 0 or 3–5, oval or spathulate, shorter than sepals. Stamens 5–10, hypogynous, filaments dilated at base and very shortly connate or confluent with disk. Ovary free, 2-celled; stigmas 2; ovules solitary. Fruit dicoccous, nuts bony, more or less plano-convex, dorsally sculptured or plane; seed vertical.—Herbs, diffuse or ascending, glandular, viscid or glabrous. Leaves alternate or subopposite, exstipulate. Flowers small, bracteate, in glomerate, sessile or pedunculate, lateral or terminal cymes.

A small genus of Tropical and South Africa and India.

More or less glandular-hispidulous. Nuts areolate-sculptured.	
Leaves oblanceolate to rotundate obtuse. Cymes lax or subcompact, often pedunculate	1. *L. viscosum.*
Leaves oval or oval oblong. Cymes dense ⅓–⅔ in. diameter, sessile	2. *L. Meyeri.*
Glandular-puberulous or glabrate. Nuts dorsally smooth. Leaves rotundate	3. *L. indicum.*
Glabrous. Leaves linear to oval, acute. Nuts dorsally tubercled	4. *L. linifolium.*

1. **L. viscosum,** *Fenzl; DC. Prod.* xiii. *pt.* 2, 23. Glandular-viscid, diffuse or ascending flaccid annual, more or less divaricately branched, ½–1 ft. or more. Leaves alternate from broadly oblanceolate or elliptical to rotundate, cuneately narrowed at base into the petiole, glandular-puberulous or glabrate, ⅓–1 in. long; petiole usually distinct. Flowers in extra-axillary more or less compact, distinctly pedunculate or subsessile cymes. Sepals subherbaceous, viscid. Petals usually 0. Stamens 7, inserted in hypogynous disk. Nuts about 1/12 in. diameter, scrobiculate- or areolate-rugose.—*Gaudinia viscosa,* J. Gay in Feruss. Bull. xviii. 412.

Upper Guinea. Senegambia, *Sieber! Leprieur!*
Nile Land. Kordofan, *Kotschy!*

Lower Guinea. Huilla and Mossamedes, Angola, and var. *hispidulum* (Welw.), shortly hispid; cymes pedunculate, rather lax, Mossamedes, *Dr. Welwitsch! Dr. Wawra.*

Var. *leiocarpum.* Nuts minutely granulated or smooth, Mossamedes, *Dr. Welwitsch!*
Also south of the tropic.

2. **L. Meyeri,** *Fenzl, Mollug.* 342, *adnot.* Nearly allied to and with all the general characters of *L. viscosum*, differing in the oval or oval-oblong leaves and flowers, congested in close sessile leaf-opposed glomerules $\frac{1}{3}$–$\frac{2}{3}$ in. in diameter. "Petals 3, clawed, obovate." Nuts tuberculate-rugose.—*L. glomeratum*, E. et Z. Enum.

Lower Guinea. Huilla, Angola, *Dr. Welwitsch!*

3. **L. indicum,** *Stocks; T. Anders. in Journ. Linn. Soc.* v. *Suppl.* (*Fl. Aden.*) 30. Divaricately branched, diffuse or subprostrate, glandular-puberulous or glabrate. Leaves opposite or nearly so, broadly elliptical or rotundate, mucronate, entire, distinctly petiolate; $\frac{1}{6}$–$\frac{1}{3}$ in. long, petiole 1–2 lines. Cymes few- or several-flowered, sessile or subsessile at the nodes. Petals clawed, toothed above. Stamens 6–7. Nuts about 1 line diameter, back quite smooth.

Nile Land. Nubia, *Dr. Bromfield! Ehrenberg!* (as *L. viscosum*, in Herb. Berol.)
Also eastward to Scinde.

4. **L. linifolium,** *Fenzl; DC. Prod.* xiii. *pt.* 2, 24. Diffuse glabrous annual (perennial, *Klotzsch*) $\frac{1}{2}$–1 ft. or more; branches rather slender, procumbent or ascending, forking. Leaves alternate, linear, subacute, narrowed at base, or oval in var. β, $\frac{1}{2}$–2 in. long, $\frac{1}{12}$–$\frac{1}{6}$ in. broad, or to $\frac{1}{2}$ in. in var. β. Cymes few or many-flowered, usually compact, sessile or subsessile, lateral extra-axillary or terminal and sometimes pedunculate, occasionally 1–$1\frac{1}{3}$ in. in diameter. Sepals apiculate, with herbaceous midrib. Petals 0 or varying to 3–5, linear-spathulate, hyaline. Stamens 7; filaments abruptly dilated at base and there confluent. Nuts bony, dorsally tuberculate or corrugate-tubercled, $\frac{1}{8}$–$\frac{1}{9}$ in. diameter.—*Dicarpæa linifolia*, Presl, Symb. Bot. i. 38, tab. 26. *Gaudinia diffusa*, J. Gay in Feruss. Bull. xviii. 412. *Acanthocarpæa sulcata*, Klotzsch in Peters' Mossamb. Bot. 138, t. 24.

Upper Guinea. Senegambia, *Leprieur!*
Lower Guinea. Mossamedes, Angola (also var. β *polygonoides* (Welw.); *L. argute-carinatum* Wawra and Peyr., Sert. Beng. 23, with narrowly elliptical leaves) *Dr. Welwitsch!* Mouth of Katombela river, *Dr. Wawra!*
Mozamb. Distr. Zambesi, *Dr. Kirk! Dr. Peters.*
Also South of the Tropic.
Of *Acathocarpæa scabrida*, Klotzsch in Peters' Mossamb. Bot. 139, I have not seen a specimen. It is not improbably a form of the above. The flowers do not in any way differ, he says, but the fruits are smaller, the leaves oblong with subscabrid pellucid margins, and the branches very minutely scabrid.

ERRATUM, Page 50.

Omit *Trigonella marginata*, Hochst. et Steud, which is correctly cited as a synonym of *Trifolium subrotundum*, Steud. et Hochst., p. 59.

INDEX OF GENERA AND SPECIES.

The Synonyms and Species incidentally mentioned are printed in Italics.

Page

Abrus 174
acutifolius, Bl. . . 175
canescens, *Welw.* . 175
lævigatus, E. Mey. . 175
melanosperma, Hassk. 175
precatorius, *Linn.* . 175
pulchellus, *Wall.* . 175
Schimperi, *Hochst.* . 175
Acacia 337
abyssinica, *Hochst.* . 347
abyssinica, Hochst. . 350
Adansonii, G. et P. 353
Adansonii, Hochst. 350
albida, *Del.* 339
amythethophylla, *Steud.* . . . 346
arabica, *Willd.* . . . 350
Asak, Willd. 340
ataxacantha, *DC.* . 343
Caffra, *Willd.* . . 345
campylacantha, Hochst. . 344, 345
Catechu, *Willd.* . . 344
Ehrenbergiana, *Hayne* . . . 352
etbaica, *Schw.* . . 349
erubescens, *Welw.* . 343
erythrantha, Steud. . 344
Farnesiana, *Willd.* . 346
fasciculata, G. et P. 353
Giraffæ, Sieb. . . 351
Giraffæ? Hochst. . 352
glaucophylla, *Steud.* 342
gynocarpa, Hochst. . 339
hamulosa, Benth. . 340
hebeclada, *DC.* . . 348
hecataphylla, *Steud.* 344
Isenbergiana, Schp. 356
Kirkii, *Oliv.* . . . 350
læta, *Br.* 341
Lahai, *S. et H.* . . 340
lasiopetala, *Oliv.* . 346
Lebbek, Willd. . . 358

Page

macrostachya, *Reich.* 343
malacophylla, Steud. 359, 361
mellifera, *Benth.* . 340
mossambicensis, Bolle 339
nigrescens, *Oliv.* . 340
nilotica, Del. . . 350
nubica, *Benth.* . . 348
pennata, *Willd.* . 345
pentagona, Hook. f. 346
pentaptera, Welw. . 346
Petersiana, Bolle. . 352
portoricensis, Willd. 354
pterygocarpa, Hchst. 349
purpurea, *Bolle* . . 343
Raddiana, Savi . . 353
reficiens, *W. et P.* . 348
robusta, *Burch.* . . 349
Rovumæ, *Oliv.* . . 353
saccharata, Benth. . 339
sanguinea, *Hochst.* . 341
Senegal, Willd. . . 340
sericocephala, Fenzl 356
Seyal, *Del.* 351
Sieberiana, *DC.* . . 347
Sing, G. et P. . . 347
spinosa, E. Mey . . 333
stenocarpa, *Hochst.* . 351
tortilis, *Hayne* . . 352
triacantha, Hochst. 342
tristis, *Welw.* . . 349
vera, Willd. . . . 350
venosa, *Hochst.* . . 341
Verek, *G. et P.* . . 342
Verek, G. et P. . . 340
verugera, Schum. . 354
Welwitschii, *Oliv.* . 341
xiphocarpa, Hochst. 347, 349
Acanthocarpæa scabrida, Kl. . . . 596
sulcata, Kl. . . . 596

Page

Acanthonotus . . . 69
Acanthosicyos . . . 531
horrida, *Welw.* . . 531
Acioa Bellayana, Baill. 372
Icondere, Baill. . . 371
pallescens, Baill. . 372
Acrotaphros bibracteata, H. et S. . . 144
Adenanthera 329
pavonina, *Linn.* . . 329
Adenocarpus 47
benguellensis, *Welw.* 47
Mannii, *Hook. f.* . 47
Adenopus 527
abyssinicus, *Hook. f.* 528
breviflorus, *Benth.* . 528
? Cienkowskii, Schw. 527
eglandulosus, *Hook. f.* 529
longiflorus, *Benth.* . 528
Ædemone mirabilis, Kotschy . . . 144
Æchmandra velutina, Dalz. 567
Æonium leucoblepharum, Webb. . . 401
Æschynomene . . . 145
acutangula, *Welw.* . 148
aspera, *Linn.* . . . 147
bracteosa, *Welw.* . 150
coluteoides, Rich. . 143
debilis, *Welw.* . . 150
dimidiata, *Welw.* . 151
fulgida, *Welw.* . . 149
glabrescens, *Welw.* . 148
indica, *Linn.* . . . 147
indica, β aspera, Hassk. . . . 148
laxiflora, Boj. . . 149
macropoda, DC. . . 147
oligantha, *Welw.* . 146
papulosa, *Welw.* . . 146
pulchella, *Pl.* . . 149
pygmæa, *Welw.* . . 148

Page

quadrata, S. et T. . 147
Ruppellii, *Baker*. . 149
Schimperi, *Hochst*. . 146
sensitiva, *Sw*. . . 147
sensitiva, Beauv. . 147
siifolia, *Welw*. . . 151
tenuirama, *Welw*. . 150
uniflora, *E. Mey*. . 146
Afzelia 301
africana, *Sm*. . . . 302
attenuata, Kl. . . 303
bracteata, *Vog*. . . 301
cuanzensis, *Welw*. . 302
? *Pancovia*, DC. . . 303
Petersiana, Kl. . . 303
Aizoon 583
canariense, *Linn*. . 584
mossamedense, *Welw*. 584
virgatum, *Welw*. . 584
Albizzia 355
affinis, Fourn. . . 356
altissima, Hook. f. . 364
amara, *Boiv*. . . . 356
angolensis, *Welw*. . 360
anthelmintica, *Bron*. 357
brachycalyx, *Oliv*. . 361
Brownei, *Walp*. . . 362
coriaria, *Welw*. . . 360
elliptica, Fourn. . 360
fastigiata, *E. Mey*. . 361
ferruginea, *Bth*. . . 361
floribunda, Kotsch. . 357
glaberrima, *Bth*. . . 358
glabrescens, *Oliv*. . 357
hypoleuca, *Oliv*. . . 356
Julibrissin, *Boiv*. . 356
Lebbek, *Bth*. . . . 358
malacophylla, Walp. 361
mollis, Boiv. . . . 356
pallida, *Fourn*. . . 359
pallida, Harv. . . 357
Petersiana, *Bolle* . 362
Quartiniana, *Walp*. . 359
rhombifolia, *Bth*. . 358
Schimperiana, *Oliv*. . 359
versicolor, *Welw*. . 359
Welwitschii, *Oliv*. . 362
Alchemilla 377
abyssinica, *Fres*. . . 378
Bachiti, Hochst. . 378
cryptantha, *Steud*. . 377
elongata, E. et Z. . 379
Gunæ, *Schw*. . . . 378
pedata, *Hochst*. . . 379
Rothii, *Oliv*. . . . 378
tenuicaulis, *Hook. f*. 378
Alhagi 142
maurorum, *Desv*. . 142

Page

Alvesia bauhinoides, Welw. 290
Alysicarpus 169
ferrugineus, *H. et S*. 170
glaber, E. Mey. . . 171
Harnieri, Schw. . 170
Hochstetteri, Rich. . 171
monilifer, *DC*. . . 169
nummularifolius, DC. 170
porrectus, *Welw*. . 171
Quartinianus, Rich. 171
rugosus, *DC*. . . . 171
styracifolius, DC. . 171
vaginalis, *DC*. . . 170
vaginalis, Hochst. . 170
Wallichii, W. et A.. 171
Zeyheri, *Harv*. . . 170
Ameletia elatinoides, Bl. 466
tenella, Bl. . . . 467
Amerimnum Sieberi, Reich. 236
Ammannia 476
aspera, *G. et P*. . . 480
attenuata, Hochst. . 478
baccifera, *Linn*. . . 478
cordata, Wt. . . 480
crassicaulis, *G. et P*. 479
diffusa, *W*. . . . 479
dodecandra, DC. . 473
ægyptiaca, W. . . 478
elatinoides, DC. . . 466
elatinoides, Hb. Schimp. . . . 468
filiformis, DC. . . 477
floribunda, G. et P. 477
glauca, Wall. . . 478
gracilis, G. et P. . 479
illecebroides, Arn. . 467
indica, Lam.. . . 478
Loandensis, *Welw*. . 480
madagascariensis, Bvn. 477
multiflora, Roxb. . 477
nana, Roxb. . . . 467
passerinoides, *Welw*. 480
pentandra, Roxb. . 467
Prieureana, G. et P. 477
pusilla, Sond. . . 477
Rotala, F. M. . . 467
salicifolia, *Monti*. . 478
salsuginosa, G. et P. 477
sarcophylla, *Welw*. . 479
senegalensis, *Lam*. . 477
tenella, G. et P. . 467
undulata, F. et M. . 477
urceolata, *Hiern*. . 478
verticillata, Lam. . 478
vesicatoria, Roxb. . 478

Page

Ampelosicyos scandens, Thouars . . . 523
Amphiblemma . . . 455
cymosum, *Naud*. . 456
molle, *Hook. f*. . . 456
setosum, *Hook. f*. . 456
Anarthrosyne abyssinica, Hochst. . . 160
cordata, Klotzsch . 162
densiflora, Klotzsch 168
gracilis, Klotzsch . 167
robusta, E. Mey. . 168
Andira 246
acuminata, Benth. . 247
? gabonica, *Baill*. . 247
grandiflora, G. et P. 247
inermis, H. B. K. . 246
Anetia, Endl. . . . 499
Anisophyllea . . . 412
laurina, *Br*. . . . 413
Anisophyllum laurinum, Don . . . 413
Anogeissus 417
leiocarpus, *G. et P*. . 418
Anonychium lanceolatum, Schw. . . 332
Anstrutheria africana, Bentb. 411
Antherotoma . . . 444
Afzelii, *Hook. f*. . 444
Naudini, *Hook. f*. . 444
Anthonota crassifolia, Baill. 298
macrophylla, Beauv. 298
Anthyllis 60
Vulneraria, *Linn*. . 60
Antopetitia abyssinica, R. et D. . . . 140
cancellata, Hochst. . 61
Aphanocalyx . . . 318
cynometroides, *Oliv*. 319
Arachis 157
hypogæa, *Linn*. . . 158
Argyrella incana, Nd. 453
Argyrolobium . . . 44
abyssinicum, *J. et S*. 45
dasycarpum, Hochst. 46
æquinoctiale, *Welw*. 46
dorycnoides, *Baker* . 45
modestum, Hochst. . 45
Petitianum, *Rich*. . 47
ramosissimum, *Baker* 46
remotum, *Hochst*. . 45
Schimperianum, *Hochst*. . . . 46
virgatum, *Baker* . 46
Astragalus 137
abyssinicus, *Hochst*. 138

prolixus, *Sieb.* . . 138
tigrensis. *Hochst.* . 138
venosus, *Hochst.* . 137
Atheranthera . . . 519
paniculata, *Mast.* . 519

Baikiæa 308
insignis, *Benth.* . . 309
minor, *Oliv.* . . . 309
Bandeiræa 284
simplicifolia, *Benth.* 285
speciosa, *Welw.* . . 284
tenuiflora, *Benth.* . 285
Banksia abyssinica, Bruce 380
Baphia 247
angolensis, *Welw.* . 249
hæmatoxylon, Hk. f. 249
Heudelotiana, *Baill.* 249
Kirkii, *Baker* . . 250
laurifolia, Baill. . 251
leptostemma, Baill. . 249
maxima, *Baker* . . 250
nitida, *Afz.* . . . 249
pilosa, *Baill.* . . 249
polygalacea, *Baker* . 248
pubescens, *Hook. f.* 250
racemosa, *Hochst* . 248
spathacea, *Hook. f.* 250
Baphiopsis 256
parviflora, *Benth.* . 256
Barringtonia 438
racemosa, *Bl.* . . 438
Barteria 510
fistulosa, *Mast.* . . 511
nigritiana, *Hook. f.* 511
Basananthe 508
littoralis, *Peyr.* . . 509
nummularia, *Welw.* 509
Bauhinia 285
abyssinica, Rich. . 291
acuminata, *Bruce* . 292
acuminata, W. et A. 290
Adansoniana, *G. et P.* 292
articulata, *DC.* . . 290
Benzoin, Kotsch. . 291
Bowkeri, *Harv.* . . 289
Burkeana, Benth. . 288
cissoides, *Welw.* . 287
fassoglensis, *Kotsch.* 286
garipensis, *E. Mey.* . 291
inermis, Sch. . . 291
Kirkii, *Oliv.* . . . 288
macrantha, *Oliv.* . 289
Mucóra, Bolle . . 290
parvifolia, Hochst. . 290
Petersiana, *Bolle* . 288
platysiliqua, Guill. . 291
punctata, *Bolle* . . 292
pyrrhocarpa, Hochst. 291
rufescens, *Lam.* . . 289
scandens, Kotsch. . 287
tamarindacea, Del. 291
Thonningii, Schum. 291
tomentosa, *Linn.* . 290
Welwitschii, *Oliv.* . 287
Begonia 569
ampla, *Hook. f.* . . 574
anisosepala, *Hook. f* 576
Annobonensis, *A. DC.* 578
asplenifolia, *Hook. f.* 578
auriculata, *Hook. f.* 577
baccata, *Hook.* . . 573
clypeifolia, *Hook. f.* 576
elæagnifolia, *Hook. f.* 579
elatostemmoides, *Hk. f.* 576
epiphytica, *Hook. f.* 580
excelsa, *Hook. f.* . 571
furfuracea, *Hook. f.* 571
hirsutula, *Hook. f.* . 575
loranthoides, *Hook. f.* 580
Mannii, *Hook. f.* . 570
oxyloba, *Welw.* . . 573
peperomioides, *Hk. f.* 575
poculifera, *Hook. f.* 574
polygonoides, *Hk. f.* 571
prismatocarpa, *Hook.* 573
rostrata, *Welw.* . . 578
scapigera, *Hook. f.* . 572
scutifolia, *Hook. f.* . 572
scutulum, *Hook. f.* . 575
sessilifolia, *Hook. f.* 577
squamulosa, *Hook. f.* 579
Benincasa 532
cerifera, *Savi* . . 532
Berebera ferruginea, Hochst. . . . 131
Berlinia 292
acuminata, *Sol.* . . 293
angolensis, *Welw.* . 296
auriculata, *Benth.* . 294
bracteosa, *Benth.* . 294
Heudelotiana, Baill. 294
paniculata, *Benth.* . 295
stipulacea, *Benth.* . 296
Besenna anthelmintica, Rich. 357
Biserrula 138
leiocarpa, Hochst. . 139
Pelecinus, *Linn.* . 139
Bistella gemminiflora, Del. 383
Bivinia 495
Jauberti, *Tul.* . . 496
Blackwellia africana, Hook. f. . . . 498
Brachystegia 305
appendiculata, *Benth.* 305
spicæformis, *Benth.* . 306
tamarindoides, *Welw.* 307
Bracteolaria polygalacea, Hook. f. . 248
racemosa, Walp. . . 249
Brayera 380
anthelmintica, *Kth.* . 380
Brexia 384
heterophylla, Noronh. 385
madagascariensis, *Bot. Reg.* 385
Brissonia trapezicarpa, Desv. 103
Bruguiera 409
capensis, Blum. . . 410
cylindrica, *Blum.* . 409
gymnorrhiza, Lam. . 410
Rheedii, Blum. . . 410
Wightii, Blum. . 410
Bryonia abyssinica, Lam. 521
capillacea, S. et T. 563
convolvuloides, Rich. 521
deltoidea, S. et T. . 563
fimbristipula, Fenzl 558
fœtidissima, S. et T. 564
jatrophæfolia, Rich. 521
laciniosa, Linn. . . 557
micrantha, Hochst. 561
obtusa, Rich. . . 561
Perrottetiana, Ser. . 564
scrobiculata, Hochst. 559
tenuis, Kl. . . . 557
Bryonopsis 556
laciniosa, *Arn.* . . 556
Bryophyllum . . . 389
calycinum, *Salisb.* . 390
Bujacia anonychia, E. Mey. 178
gamsonychia, E. Mey. 181
Bulliarda abyssinica, Rich. 388
aquatica, DC. . . 388
Vaillantii, DC. . . 387
Vaillantii, Sch. . . 388
Bülowia illustris, S. et T. 507
Burkea 319
africana, *Hook.* . . 320
Byrsanthus 498
Brownii, *Endl.* . . 499
epigynus, *Mast.* . . 499

Cacoucia 433
bracteata, *Laws.* . 434
coccinea, *Aubl.* . . 434

	Page
paniculata, *Laws.*	434
villosa, *Laws.*	433
CACTACEÆ	580
Cadia	255
purpurea, W.	256
varia, *L'Her.*	255
Cæsalpinia	262
Bonducella, *Roxb.*	262
pulcherrima, *Sw.*	262
elata, *Sw.*	266
CÆSALPINIEÆ	258
Caillea dichrostachys, G. et P.	333
Cajanus	215
bicolor, DC.	216
flavus, DC.	216
indicus, *Spr.*	216
Calliandra	354
portoricensis, *Benth.*	354
Callitriche	406
stagnatis, *Scop.*	406
Calpurnia	252
aurea, *Baker*	252
lasiogyne, E. Mey.	253
Calvoa	457
crassinoda, *Hook. f.*	457
hirsuta, *Hook. f.*	457
sinuata, *Hook. f.*	457
Calycandra pinnata, Rich.	258
Camoënsia	251
brevicalyx, *Benth.*	251
maxima, *Welw.*	252
Canavalia	189
emarginata, Don.	190
ensiformis, *DC.*	190
gladiata, DC.	190
mollis, Wall.	191
obtusifolia, DC.	190
polystachya, Schw.	190
Capassa violacea, Kl.	242
Carpolobia dubia, Don.	248
versicolor, Don.	249
Carpopogon pruriens, Roxb.	187
Caryophyllus aromaticus, L.	438
Casearia	493
Barteri, *Mast.*	494
gladiiformis, *Mast.*	493
guineensis, *Don.*	494
Mannii, *Mast.*	494
prismatocarpa, *Mast.*	494
stipitata, *Mast.*	493
Cassia	268
abbreviata, *Oliv.*	271
Absus, *Linn.*	279
acutifolia, *Del.*	278
Afzeliana, Vog.	276
alata, *Linn.*	275
angustifolia, *Vahl.*	279
Arereh, *Del.*	270
bracteosa, Welw.	277
cana, Wend.	278
Chamæcrista, Linn.	281
contorta, Vog.	274-275
Delagoensis, Harv.	272
didymobotrya, *Fres.*	276
falcinella, *Oliv.*	281
Fistula, Hb. Sch.	271
Fistula, Linn.	270
geminata, S. et T.	281
glauca, Lam.	277
goratensis, *Fres.*	273
gracillima, Welw.	281
Grantii, *Oliv.*	279
holosericea, *Fres.*	278
Kirkii, *Oliv.*	281
Kotschyana, *Oliv.*	271
lævigata, *W.*	275
lanceolata, W. et A.	279
Mannii, *Oliv.*	272
micrantha, *G. et P.*	280
microphylla, W.	281
mimosoides, *Linn.*	280
nigricans, *V.*	280
obovata, *Coll.*	277
obtusifolia, Linn.	275
occidentalis, *Linn.*	274
Petersiana, *Bolle*	272
planisiliqua, Linn.	274
podocarpa, *G. et P.*	276
psilocarpa, Welw.	270
pubescens, Br.	278
Sabak, Del.	273
Schimperi, Steud.	278
Sieberiana, *DC.*	270
Singueana, Del.	273
Sophera, *Linn.*	274
strobilacea, H. B. K.	276
tettensis, *Bolle*	273
Thonningii, DC.	279
tomentosa, L. f.	274
Tora, *Linn.*	274, 275
venusta, F. M.	277
viscosa, S. et T.	279
zambesica, *Oliv.*	280
Cassipourea africana, Benth.	411
Cathartocarpus Atteleh, Don	271
conspicuus, Don	270
Centrosema	176
decumbens, Mart.	176
virginiana, *Benth.*	176
Cephalandra	550
decipiens, *Hook. f.*	552
diversifolia, *Naud.*	551
indica, *Naud.*	550
pubescens, *Sond.*	551
quinqueloba, *Schrad.*	551
senensis, *Klotzsch*	552
Ceriops	408
Candolleana, *Arn.*	409
mossambicensis, *Kl.*	409
Chamæfistula contorta, Don	275
Chirocalyx abyssinicus, Hochst.	184
mollissima, Meiss.	184
Chrysobalanus	365
ellipticus, *Sol.*	366
guianensis, Kl.	366
Icaco, *Linn.*	365
orbicularis, S. et T.	365
pellocarpus, Mey.	365
Chrysocalyx ebenoides, G. et P.	21
gracilis, G. et P.	20
Perrottetii, G. et P.	20
Petitiana, Rich.	20
Quartiniana, Rich.	41
rubiginosa, G. et P.	22
Schimperi, Hochst.	32
Cicer	172
arietinum, *Linn.*	172
cuneatum, Hochst.	172
Citrullus	548
amarus, Schrad.	549
Colocynthis, *Schrad.*	548
Naudinianus, *Hk. f.*	549
vulgaris, *Schrad.*	549
Cladosicyos	534
edulis, *Hook. f.*	534
Clemanthus senensis, Kl.	513
Cleome raphanoides, DC.	503
Cliffortia	379
? flabellifolia, Sond.	404
linearifolia, *E. et Z.*	379
Clitoria	176
Ternatea, *Linn.*	177
virginiana, Linn.	176
viridiflora, Bout.	211
Cnidone mentzelioides, E. Mey.	501
Coccinia Hartmanniana, Schw.	551
indica, Wt.	550
Moghad, Asch.	551
palmata, Sond.	551
palmatisecta, Kotsch.	551
Schimperi, Naud.	550

Codarium acutifolium, Afz. 283
discolor, DC. 283
obtusifolium, Afz. . 283
Solandri, V. 283
Colutea, *Linn.* 136
haleppica, *Lam.* . . 136
Pocockii, Ait. . . 136
Combesia abyssinica, Rich. 387
Schimperi, Schw. . 386
COMBRETACEÆ . . . 413
Combretum 419
aculeatum, *Vent.* . . 423
acutum, *Laws* . . 424
adenogonium, Steud. 432
Afzelii, Don . . . 423
altum, *Perr.* . . . 428
angolense, *Welw.* . 428
anisopterum, *Welw.* 429
apiculatum, *Sond.* . 429
argyrotrichum, *Welw.* 432
capituliflorum, *Fenzl* 425
celastroides, *Welw.* . 422
chrysophyllum, G.etP. 431
collinum, *Fres.* . . 427
comosum, *Don* . . 421
confertum, *Laws.* . 422
constrictum, *Laws.* . 423
corymbosum, S. et T. 424
cuspidatum, *Pl.* . . 426
elæagnifolium, Pl. . 427
elæagnoides, *Kl.* . . 426
ferrugineum, Rich. . 431
fuscum, *Pl.* . . . 426
glutinosum, Hochst. . 427
glutinosum, *Perr.* . 432
grandiflorum, *Don* . 423
Hartmannianum, Schw. 431
herbaceum, *Don* . . 433
hispidum, *Laws.* . . 421
holosericeum, *Sond.* 430
intermedium, Don . 422
Kirkii, *Laws.* . . 429
Klotzschii, *Welw.* . 422
Kraussii, Hochst. . 431
laxiflorum, *Welw.* . 428
lepidotum, *Hochst.* . 427
leucophyllum, Don . 424
macrocarpum, Beauv. 424
micranthum, Don . 428
microphyllum, *Kl.* . 427
molle, Br. . . . 432
mucronatum, *Thonn.* 426
myrtifolium, *Laws* . 431
nigricans, *Lepr.* . . 431
ovale, Br. 424
oxystachyum, *Welw.* 422
paniculatum, *Vent.* . 425
paniculatum, Vent. ? 422
paradoxum, *Welw.* . 430
parviflorum, Don . 428
pentagonum, *Laws.* . 424
Petitianum, *Rich.* . 432
platypetalum, *Welw.* 433
punctatum, Rich. . 427
Quartinianum, Rich. 427
racemosum, *Beauv.* . 424
reticulatum, *Fresen.* 432
reticulatum, Hb. Schimp. . . . 432
rubiginosum, *Welw.* . 428
Rüppellianum, Rich. 431
Schimperianum, Rich. 431
sericeum, *Don* . . 424
Smeathmanni, Don . 426
spinosum, Don . . 425
tetragonum, *Laws* . 430
tinctorum, Welw. . 430
tricanthum, *Fresen.* 431-2
trigonoides, Perr. . 424
truncatum, *Welw.* . 427
vernicosum, Fenzl . 427
virgatum, *Welw.* . . 425
Coniandra corallina, Fenzl 565
Conocarpus 417
erecta, *Jacq.* . . . 417
leiocarpa, DC. . . 418
parvifolium, Hochst. 418
racemosa, L. f. . . 419
Schimperi, Hochst. . 418
Copaifera 313
coleosperma, *Benth.* 314
Gorskiana, *Benth.* . 315
Guibourtiana, *Benth.* 314
Mopane, *Kirk.* . . 315
Copisma falcatum, E. Mey. 219
gibbum, E. Mey. . . 220
pictum, E. Mey. . . 220
subsericeum, Sond. . 189
tenue, E. Mey. . . 219
Corallocarpus . . . 565
Ehrenbergii, *Hook. f.* 566
erostris, *Hook. f.* . 567
etbaicus, *Hook. f.* . 567
Fenzlii, *Hook. f.* . 565
Gijef, *Hook. f.* . . 566
Schimperi, *Hook. f.* 567
Welwitschii, *Hook. f.* 566
Cordyla 257
africana, *Lour.* . . 258
Cordylia africana, Pers. 258
Cotyledon 398
crenata, Vent. . . 394
deficiens, Forsk. . . 394
deficiens, H. et S. . 391
orbiculata, *Linn.* . . 398
simensis, *Britten* . 399
Umbilicus, *Linn.* . 398
Verea, *Jacq.* . . . 394
Coulteria? africana, G. et P. . . . 332
Crassula 388
abyssinica, *Rich.* . . 388
campestris, E. et Z. . 387
globularioides, *Britt.* 389
Mannii, Hook. f. . 388
pharnaceoides, C.A.M. 387
puberula, Br. . . 389
Schimperi, C.A.M. . 386
subulata, Harv. . . 387
sediformis, *Schw.* . 389
Turrita, Thunb. . 387
CRASSULACEÆ . . . 385
Crassularia sediformis, Hochst. 389
Crossostemma . . . 511
laurifolium, *Pl.* . . 511
Crotalaria 7
abscondita, *Welw.* . 19
acutifolia, Steud. . 12
Afzelii, Br. . . . 36
amœna, *Welw.* . . 26
anthyllopsis, *Welw.* . 15
arborescens, Lam. . 38
arenaria, *Benth.* . . 11
argyræa, *Welw.* . . 26
arvensis, Kl. . . . 17
astragalina, *Hochst.* . 43
atrorubens, *Hochst.* . 22
brevidens, *Benth.* . 37
cærulea, Jacq. . . 14
calycina, *Schr.* . . 15
capensis, *Jacq.* . . 38
carinata, St. . . . 31
caudata, *Welw.* . . 18
cephalotes, *Steud.* . 23
cistoides, *Welw.* . . 18
cleomifolia, *Welw.* . 43
comosa, *Baker* . . 34
cordata, *Welw.* . . 27
cyanea, *Baker* . . 39
cylindrica, Rich. . 35
cylindrocarpa, *DC.* . 40
cylindrostachys, *Welw.* 15
decumbens, *Welw.* . 33
densicephala, *Welw.* 21
Dilloniana, *Baker* . 41
Doniana, *Baker* . 28
dorycnium, Rich. . 16
dumetorum, *Baker* . 22

ebenoides, *Walp.* . 20
elata, *Welw.* . . . 29
emarginata, *Boj.* . . 35
ervoides, *Welw.* . . 19
erythrophleba, *Welw.* 25
falcata, S. et T. . . 29
falcata, *V.* . . . 40
fertilis, *Del.* . . . 41
filicaulis, *Welw.* . . 24
flexuosa, *Baker* . . 29
florida, *Welw.* . . 30
Forbesii, *Baker* . . 18
fulgida, *Baker* . . 32
genistifolia, S. et T. 12
glauca, *W.* . . . 12
glaucifolia, *Baker* . 38
goreensis, *G. et P.* . 28
gracilis, *Walp.* . . 20
gracillima, Kl. . . 25
Grantii, *Baker* . . 32
holoptera, *Welw.* . 13
hyssopifolia, *Kl.* . . 24
impressa, Nees. . . 43
incana, *Linn.* . . 31
intermedia, *Kotsch.* 37
involucrata, Sol. . 22
iodina, Benth. . . 22
ivantulensis, *Welw.* . 26
Kirkii, *Baker* . . 36
laburnoides, Kl. . . 38
lachnocarpa, *Hochst.* 33
lachnophora, Rich. . 33
lævigata, β, Benth. . 19
lanceolata, *E. Mey.* . 36
lathyroides, *G. et P.* 35
Leprieurii, *G. et P.* . 14
lotifolia, *Linn.* . . 42
lotoides, Rich. . . 16
Lotononis, *Welw.* . 39
lupinoides, *Hochst.* . 39
macilenta, Del. . . 31
macrocalyx, *Benth.* . 20
macropoda, Hochst. 27
macrostipula, St. . 29
Mariæ-Antoniæ, Asch. 16
maxillaris, *Kl.* . . 30
melilotoides, Steud. . 43
microcarpa, *Hochst.* 16
microphylla, *V.* . . 16
montana, *Rich.* . . 31
mossambicensis, Kl. . 36
natalitia, *Meiss.* . . 34
nigricans, *Baker* . 21
nubica, *Bth.* . . . 23
nutans, *Welw.* . . 24
ochroleuca, *G. Don* . 37
oligostachya, *Baker* . 41
Onobrychis, *Rich.* . 28
ononoides, *Bth.* . . 22
orthoclada, *Welw.* . 29
orixensis, *Roxb.* . . 27
pallida, Kl. . . . 38
parvula, *Welw.* . . 25
Perrottetii, *DC.* . . 19
physocarpa, Fenzl . 17
pilifera, Kl. . . . 17
pisicarpa, *Welw.* . 16
pisiformis, G. et P.. 38
platycalyx, *Steud.* . 42
platysepala, *Harv.* . 34
Plowdeni, *Baker* . 41
podocarpa, *DC.* . . 17
polycarpa, Bth. . . 23
polyclados, *Welw.* . 17
polygaloides, *Welw.* 15
polysperma, *Kotsch.* 42
prolongata, *Baker* . 25
protensa, *Welw.* . . 35
pumila, H. et S. . 17
pycnostachya, *Bth.* . 43
Quartiniana, *Rich.* . 42
ramosissima, *Baker* 26
recta, *Steud.* . . . 40
remotiflora, Hochst. 31
retusa, *Linn.* . . 13
Saltiana, Andr. . . 38
Schimperi, Rich. . 32
senegalensis, *Bacle.* . 31
simplex, Rich. . . 40
spartea, *Br.* . . . 12
sphærocarpa, *Perr.* . 23
sphærocarpa, *var.* Hochst. 23
spinosa, *Hochst.* . . 17
stenoptera, *Welw.* . 12
Steudneri, *Schw.* . 30
Stewartii, *Baker* . 32
striata, *DC.* . . . 38
striata, S. et T. . . 40
striata, A. Br. . . 43
tenuirama, *Welw.* . 24
thebaica, *DC.* . . 11
thebaica, G. et P. . 12
tigrensis, *Baker* . . 36
triantha, Steud. . . 16
uncinata, *Welw.* . 33
uniflora, *Baker* . . 13
variegata, *Welw.* . 19
verrucosa, *Linn.* . 14
versicolor, *Baker* . 28
virgatula, *Kl.* . . 30
Vogelii, *Bth.* . . . 14
Welwitschii, *Baker* . 13
zanzibarica, *Bth.* . . 35
Crudia 312
senegalensis, *Pl.* . 312
Cryptosepalum . . . 303
maraviense, *Oliv.* . 304
? mimosoides, *Welw.* 305
tetraphyllum, *Bth.* . 304
Ctenolepis 557
cerasiformis, *Hook. f.* 558
Cucumeropsis . . . 533
Mannii, *Naud.* . . 534
Cucumis 542
abyssinicus, Rich. . 544
abyssinicus, Hb. Schimp. . . . 544
amarus, Stocks . . 545
ambigua, Fenzl . . 543
arabicus, Del. . . 545
arenarius, S. et T. . 546
Bardana, Fenzl . . 543
Chate, Linn. . . . 543
chrysocomus, S. et T. 544
cognata, Fenzl. . . 543
dipsaceus, *Ehrenb.* . 543
dissectifolius, Naud. 549
ficifolius, Rich. . . 544
Figarei, *Del.* . . . 543
Figarei, Del. *var.* . 544
hirsutus, *Sond.* . . 546
longipes, *Hook. f.* . 547
madraspatanus, Rox. 546
Melo, *Linn.* . . . 546
membranifolius, *Hk. f.* 545
metuliferus, *E. Mey.* 543
Naudinianus, Sond. 549
prophetarum, *Linn.* 545
pustulatus, *Hook. f.* 544
sagittatus, W. et P. 546
sativus, *Linn.* 542, 543
? striatus, Rich. 544, 547, 552
subsericeus, *Hook. f.* 545
Tinneanus, K. et P. 543
Cucurbita 555
maxima, *Duch.* . . 555
melanosperma, Braun. 556
moschata, *Duch.* . 556
Pepo, *DC.* . . . 556
CUCURBITACEÆ . . . 521
Cyamopsis 65
senegalensis, G. et P. 65
Cyanospermum calycinum, Hook. f. . 218
tomentosum, W. et A. 218
Cyclocarpa stellaris, Afz. 151
Cylista albiflora, Bot. Mag.. 218
? pycnostachya, DC. . 218
tomentosa, Roxb. . 218

Cynometra 316
Afzelii, *Oliv.* . . . 318
floribunda, *Bth.* . . 318
Heudelotiana, Pl. . 317
laxiflora, *Bth.* . . 318
Mannii, *Oliv.* . . . 317
? tetraphylla, Hook. f. 304
Vogelii, *Hook. f.* . 317
Cyrtonema convolvulacea, Fenzl . . . 564
divergens, Hochst. . 564
? elegans, Fenzl . . 568
fœtens, Hochst. . . 564
hirtellum, Hochst. . 564
Cytisus Cajan, Linn. . 216
glomeratus, Boj. . 226
guineensis, S. et T. . 216
pseudo-cajan, Jacq. . 216
Schimperianus, Steud. 46

Dactyliandra . . . 557
Welwitschii, *Hk. f.* 557
Dactylopetalum . . 411
Barteri, *Hook. f.* . 412
Mannii, *Hook. f.* . 412
Dalbergia 232
Afzelii, *Baker* . . 234
arbutifolia, *Baker* . 232
Bakeri, *Welw.* . . 235
bracteolata, *Baker* . 234
hostilis, *Benth.* . . 232
macrosperma, *Welw.* 235
malifolia, *Welw.* . . 233
melanoxylon, *G. et P.* 233
multijuga, *E. Mey.* 232
nitidula, *Welw.* . . 235
præcox, Hochst. . . 239
pubescens, *Hook. f.* 234
saxatilis, *Hook. f.* . 233
striata, Boj. . . . 126
Dalhousiea 247
bracteata, *Wall.* . 247
Daniellia 299
oblonga, *Oliv.* . . 300
thurifera, *Bennett* . 300
Delaria pyrifolia, Desv. 248
Derris 244
brachyptera, *Baker* . 246
Forsteniana, *Miq.* . 246
? glabrata, *Welw.* . 244
lucida, *Welw.* . . 245
nobilis, *Welw.* . . 245
uliginosa, *Benth.* . 245
Desmanthus 334
divergens, W. . . 333
lacustris, Willd. . 334
leptostachys, DC. . 333
natans, Willd. . . 334
nutans, DC. . . . 333
stolonifer, DC. . . 334
trichostachys, DC. . 333
virgatus, *Willd.* . . 334
Desmodium 159
abyssinicum, DC. . 165
angulatum, DC. . . 166
ascendens, *DC.* . . 162
Bullamense, Don . 166
Caffrum, E. et Z. . 165
capitatum, DC. . . 166
delicatulum, *Rich.* . 163
dimorphum, *Welw.* . 161
Dregeanum, *Benth.* 165
gangeticum, *DC.* . 161
grande, E. Mey. . . 166
heterocarpum, DC. . 166
hirtum, *G. et P.* . 163
incanum, *DC.* . . 163
juanense, Boj. . . 166
lasiocarpum, *DC.* . 162
lateristachys, Boj. . 166
latifolium, DC. . . 162
lincarifolium, Don . 164
mauritianum, *DC.* . 164
ospriostreblum, Std. 160
ovalifolium, G. et P. 164
oxalidifolium, Don . 162
oxybracteum, DC. . 166
paleaceum, *G. et P.* 166
polycarpum, *DC.* . 165
polygonoides, *Welw.* 161
punctatum, DC. . . 223
racemiferum, DC. . 162
ramosissimum, Don 164
Scalpe, *DC.* . . . 164
Schimperi, Hochst. . 165
Sennaarense, *Schw.* . 164
setigerum, Benth. . 163
sparsiflorum, Don . 164
spirale, *DC.* . . . 160
strangulatum, W. et A. 165
tenue, Don . . . 164
terminale, G. et P. . 160
tortuosum, Webb . 166
trichocaulon, DC. . 165
triflorum, *DC* . . 166
umbellatum, *DC.* . 166
Detarium 312
Heudelotianum, Bail. 313
microcarpum, G. et P. 313
senegalense, *Gmel.* . 313
Dialium 282
angolense, *Welw.* . 283
discolor, Hook. f. . 283
guineense, *W.* . . 283
nitidum, G. et P. . 283
Dicarpæa linifolia, Presl 596
Dicellandra 459
Barteri, *Hook. f.* . 459
? setosa, *Hook. f.* . 459
Dichrostachys . . . 332
cinerea, W. et A. . 333
Forbesii, Benth. . 333
nutans, *Benth.* . . 333
platycarpa, *Welw.* . 333
Didelotia 307
africana, *Baill.* . . 307
Diesingia scandens, Endl. 209
Dimorphochlamys . . 549
Mannii, *Hook. f.* . 550
Dinophora 444
spenneroides, *Benth.* 445
Dioclea 189
reflexa, *Hook. f.* . . 189
Diplochonium sesuvioides, W. et P. . 586
Diplotheca abyssinica, Hochst. . . . 138
atropilosula, Hochst. 130
tigrensis, Hochst. . 138
venosa, Hochst. . . 138
Disporocarpa pentandra, Asch. . . 386
Dissomeria 496
crenata, *Benth.* . . 496
Dissotis 447
Afzelii, *Hook. f.* . 449
antennina, *Hook. f.* 451
Barteri, *Hook. f.* . 454
canescens, *Hook. f.* 453
capitata, *Hook. f.* . 449
cornifolia, *Hook. f.* . 448
eximia, *Hook. f.* . 454
grandiflora, *Benth.* . 455
hirsuta, *Hook. f.* . 450
Irvingiana, *Hook.* . 453
lævis, *Hook. f.* . . 451
Melleri, *Hook. f.* . 453
petiolata, *Hook. f.* . 448
phœotricha, *Hook. f.* 451
plumosa, *Hook. f.* . 452
prostrata, *Hook. f.* . 452
radicans, *Hook. f.* . 450
segregata, *Hook. f.* . 448
theæfolia, *Hook. f.* 449
villosa, *Hook. f.* . 450
Distemonanthus . . 282
laxus, *Oliv.* . . . 282
Dolichos 209
andongensis, *Welw.* 213
argenteus, W. . . 200
axillaris, *E. Mey.* . 211

biflorus, *Linn.* . . 210
brevicaulis, *Baker* . 211
Cutiang, Linn. . . 205
Cienkowskii, S. et A. 190
coriaceus, Grah. . 189
crenatifructus, Steud. 210
Daltoni, Webb . . 211
debilis, *Hochst.* . . 213
debilis, Don . . . 222
densiflorus, *Welw.* . 214
? Dongaluta, *Welw.* . 214
elatus, *Welw.* . . 214
formosus, *Rich.* . . 213
glutinosus, Roxb. . 222
gracilis, G. et P. . 205
Lablab, *Linn.* . . 210
melanopthalmus, DC. 205
? mitis, Rich. . . 213
obovatus, S. et T. . 190
oleraceus, S. et T. . 205
Oliveri, *Schw.* . . 212
ovalifolius, S. et T. 190
pseudo-cajanus, *Wel.* 215
purpureus, Linn. . 210
reticulatus, Rich. . 214
rupestris, *Welw.* . 212
sinensis, Forsk. . 204
sinensis, Linn. . . 205
splendens, *Welw.* . 215
stenocarpus, *Hochst.* 213
stipulosus, *Welw.* . 212
subæqualis, Wall. . 209
suffultus, Grah. . . 209
tranquebaricus, Jacq. 205
unguiculatus, Linn. 205
uniflorus, *Lam.* . . 211
Dorycnium Schimperi, J. et S. . . . 62
Drepanocarpus . . . 237
lunatus *G. F. M.* . 237
DROSERACEÆ . . . 401
Drosera 401
affinis, *Welw.* . . 402
Burkeana, *Planch.* . 402
Burmanni, *V.* . . 402
capensis, Linn. . . 402
flexicaulis, *Welw.* . 403
indica, *Linn.* . . . 402
madagascariensis, DC. 403
minor, S. et T. . . 403
ramentacea, *Burch.* 403
Duparquetia orchidacea, Baill. . . . 267

Ecastaphyllum . . . 236
Benthamianum, Miq. 236
Berterii, DC. . . . 236
Brownei, *Pers.* . . 236
hygrophilum, Mart. 236
monetaria, *Pers.* . 236
nitidum, Mart. . . 236
Plumieri, Pers. . . 236
Richardi, Pers. . . 236
Eilemanthus strobilifer, Hochst. . . 75
Elephantorrhiza Petersiana, Bolle . . 328
Entada 325
abyssinica, *Steud.* . 327
africana, *G. et P.* . 326
? Duparquetiana, Bll. 328
? durissima, Baill. . 328
Pursætha, DC. . . 325
scandens, *Bth.* . . 325
sudanica, *Schw.* . . 327
Wahlbergii, *Harv.* . 326
Epilobium 486
cordifolium, *Rich.* . 487
fissipetalum, Steud. . 487
foliosum, Hochst. . 487
hirsutum, *Linn.* . 487
Schimperianum, *Rich.* 487
stereophyllum, Fres. 487
villosum, Thunb. . 487
Eriosema 223
Afzelii, *Baker* . . 225
cajanoides, *Hook. f.* 227
consanguineum, Kl. 226
cordifolium, *Hochst.* 224
ellipticum, *Welw.* . 227
elongatum, Baill. . 229
flemingioides, *Baker* 229
floribundum, Kl. . 228
glomeratum, *Hook f.* 228
gracile, Kl. . . . 228
griseum, *Baker* . . 228
incanum, Kl. . . 228
longipedunculatum, *Rich.* 227
macrophyllum, Kl. . 228
Murixia, *Welw.* . . 229
parviflorum, *E. Mey.* 225
pauciflorum, *Kl.* . 226
podostachyum, Hk.f. 226
polystachyum, *Bak.* 225
polystachyum, E. Mey. . . . 228
pygmæum, *Welw.* . 225
radicosum, *Rich.* . 226
robustum, *Baker* . 229
rufum, Baill. . . 228
sericeum, *Baker* . . 226
speciosum, *Welw.* . 230
spicatum, Hook. f. . 226
tuberosum, Hochst. . 224
Ervum hirsutum, Linn. 173
Lens, Linn. . . . 173
Erythrina 181
abyssinica, Lam. . 184
Brucei, *Schw.* . . 182
Caffra, DC. . . . 182
excelsa, *Baker* . . 183
guineensis, Don . . 182
hastifolia, Bert. . . 182
huillensis, *Welw.* . 183
Humei, *E. Mey.* . 182
latifolia, S. et T. . 182
latissima, E. Mey. . 184
Livingstoniana, *Bak.* 182
pelligera, Fenzl . . 184
Sandersoni, Harv. . 184
senegalensis, *DC.* . 181
senegalensis, Rich. . 183
suberifera, *Welw.* . 183
tomentosa, *Br.* . . 184
Vogelii, Hook. f. . 182
Erythrophlœum . . . 320
guineense, *Don* . . 320
judiciale, Proct. . 321
ordale, Bolle . . 321
Eugenia 436
calophylloides, *DC.* . 437
calycina, *Benth.* . . 437
caryophylloides, Bth. 437
cordata, *Laws* . . 438
coronata, *Vahl.* . . 437
memecyloides, *Bth.* . 437
Michelii, *Lam.* . . 437
owariensis, *Beauv.* . 438
salicifolia, *Laws* . 437
Euryandra 533
formosa, *Hook. f.* . 533

Fagelia resinosa, Rich. 218
Feuillæa pedata, B. M. 523
FICOIDEÆ 581
Fillæa ? Brucei, Fres. 264
suaveolens, G. et P. 321
Fissenia capensis, Endl. 501
Flemingia 230
faginea, *Baker* . . 230
guineensis, Don . . 231
oblongifolia, *Baker* . 230
rhodocarpa, *Baker* . 231

Galactia 188
mucronata, Kl. . . 189
tenuiflora, *W. et A.* 188
villosa, W. et A. . . 189
Galega apollinea, Del. 124
Galenia 584
africana, *L.* . . . 585

Page

Gaudinia diffusa, Gay 596
viscosa, Gay . . . 595
Geissaspis 154
lupulina, *Pl.* . . . 155
Gisekia 593
aspera, Kl. . . . 594
congesta, *Moq.* . . 594
linearifolia, S. et T. 594
linearifolia, Fenzl . 594
Miltus, *Fenzl* . . 594
pentadecandra, E. M. 594
pharnaceoides, *Linn.* 593
rubella, *Hochst.* . . 594
Gleditschia 265
africana, *Welw.* . . 265
Glinus denticulatus, Fenzl 591
lotoides, Lœfl. . . 590
Mollugo, Fenzl . . 591
mozambicensis, Spr. 594
mucronata, Kl. . . 589
Glycine 178
abyssinica, Hochst. . 181
andongensis, *Welw.* . 179
axilliflora, Kotsch. . 181
biflora, *S. et T.* . . 180
Borianii, *Baker* . . 180
caribœa, Jacq. . . 220
elegans, Hochst. . . 221
hedysaroides, *W.* . . 179
javanica, *Linn.* . . 178
longicauda, Schw. . 178
malacophylla, Spr. . 220
Memnonia, Del. . 220
micans, *Welw.* . . 179
micrantha, Hochst. . 178
mollis, Hook. . . 220
moniliformis, Hochst. 178
parviflora, Lam. . . 181
Petitiana, *Schw.* . . 179
rhombea, S et T. . 219
rufa, S. et T. . . 228
Schimperi, H. et S. . 220
senegalensis, DC. . 181
sublobata, S. et T. . 220
Griffonia 371
Barteri, *Hook. f.* . 373
Bellayana, *Oliv.* . . 371
Icondere, *Oliv.* . . 371
Mannii, *Oliv.* . . 372
pallescens, *Oliv.* . 372
physocarpa, Baill. . 285
Grislea micropetala, Hochst 481
multiflora, Rich . . 481
tomentosa, Roxb. . 481
uniflora, Rich. . . 481
Gorskia conjugata, Bolle 315

Page

Guibourtia copallifera, Benn. 314
Guiera 418
senegalensis, *Lam.* . 418
Guilandina Bonduc, Ait. 263
Bonducella, Linn. . 263
Gunnera 405
perpensa, *Linn.* . . 406
Guyouia 443
ciliata, *Hook. f.* . . 443
tenella, *Naud.* . . 443
Gyrocarpus 435
Jacquini, *Roxb.* . . 435

Hagenia abyssinica, Willd. 380
HALORAGEÆ 404
HAMAMELIDEÆ . . . 403
Hardwickia 315
? Manni, *Oliv.* . . 316
Hedysarum bupleurifolium, Reich. . 170
deltoides, Poir. . . 162
deltoideum, S. et T. 162
fruticulosum, S. et T. 164
gangeticum, Linn. . 162
granulatum, S. et T. 166
heterocarpum, Linn 166
lanceolatum, S. et T. 162
latifolium, Roxb. . 162
maculatum, Linn. . 162
ovalifolium, S. et T. 171
pictum, Jacq. . . 169
repandum, Poir. . 165
rugosum, S. et T. . 171
Helminthocarpum . . 60
abyssinicum, *Rich.* . 60
Hemispadon pilosus, Endl. 82
Herminiera Elaphroxylon, *G. et P.* . . 144
excelsa, Kotsch. . . 145
humilis, Kotsch. . 145
Heterosicyos . . . 525
polymorpha, *Welw.* 526
stenoloba, *Welw.* . 526
Heterotis antennina, Benth. 451
capitata, Benth. . 449
cornifolia, Benth. . 448
lævis, Benth. . . . 451
plumosa, Benth. . 452
prostrata, Benth. . 452
segregata, Benth. . 448
theæfolia, Benth. . 449
Heylandia Perrottetii, Spr. 20

Page

Hoffmanseggia . . . 263
Burchellii, *Benth.* . 263
Homalium, *Benth.* . . 497
africanum, *Benth.* . 497
angustifolium, *Sm.* . 498
longistylum, *Mast.* . 497
stipulaceum, *Welw.* 498
Hydrolythrum Wallichii, Hook. f. . 469
Hymenæa verrucosa, Gært. 311
Hypertelis verrucosa, Fenzl 592
Hypobrichia Spruceana, Benth. 467

Indigofera 65
abyssinica, Hochst. . 97
æruginis, Schw. . . 79
agowensis, Hochst. . 81
alta, Schw. 97
alternans, *DC.* . . 89
amorphoides, *J. et S.* 97
anceps, V. 96
Anil, *Linn.* 98
Anil, var. *orthocarpa*, DC. . . 99
arabica, *J. et S.* . . 103
arcuata, W. 87
arenaria, *Rich.* . . 79
argentea, *Linn.* . . 97
argentea, Burm. . 93
arrecta, *Hochst.* . . 97
articulata, Gouan . 93
aspera, *Perr.* . . 102
asperifolia, Hochst. 79
astragalina, *G. et P.* 89
atriceps, *Hook. f.* . 94
Bainesii, *Baker* . . 71
benguellensis, *Baker* 87
Binderi, *Kotsch.* . . 91
bongensis, *K. et P.* . 74
brachypoda, Steud. 84
bracteolata, *DC.* . 77
Brassii, *Baker* . . 76
cærulea, Roxb. . . 98
capitata, *Kotsch.* . 75
cinerea, W. 87
coluteifolia, J. et S. 100
concinna, *Baker* . . 80
congesta, *Welw.* . . 70
conjugata, *Baker* . 75
consanguinea, Kl. . 82
cordifolia, *Roth.* . . 72
costata, *G. et P.* . . 95
crotalarioides, *Baker* 85
daleoides, *Benth.* . 95
deflexa, Hochst. . 83

dendroides, *Jacq.* . 100
diphylla, *Vent.* . . 74
Dorycnium, Fenzl . 76
echinata, *W.* . . . 69
emarginella, *Steud.* . 99
endecaphylla, *Jacq.* . 96
enneaphylla, *Linn.* . 95
erythrantha, Hochst. 88
erythrogramma, *Wel.* 73
ervoides, *Rich.* . . 103
ferruginea, S. et T. . 88
flaccida, Kœnig. . 87
flavicans, *Baker* . . 73
fragrans, Retz . . 82
fulgens, *Baker* . . 101
fusca, Don . . . 88
geminata, *Baker* . 81
glabra, Linn. . . 82
glauca, Lam. . . 98
glutinosa, Roxb. . 82
glutinosa, S. et T. . 94
goniodes, *Hochst.* . 85
grisea, *Baker* . . . 80
guineensis, S. et T. . 82
hedysaroides, Lam. . 87
heterocarpa, *Welw.* 90
Heudelotii, *Benth.* . 85
hirsuta, *Linn.* . . 88
Hochstetteri, *Baker*. 101
hololeuca, Benth. . 89
indica, Lam. . . . 99
Inhambanensis, *Kl.* 87
Knoblecheri, *Kotsch.* 73
lateritia, W. . . . 82
linearis, G. et P. . 83
linifolia, Retz. . . 70
machærocarpa, Fenzl. 83
macrocalyx, *G. et P.* 71
macrocarpa, *Lepr.* . 72
macrophylla, *S. et T.* 100
maritima, *Baker* . 89
medicaginea, *Welw.* 86
melanotricha, Steud. 94
mimosoides, *Baker* . 90
multijuga, *Baker* . 83
nigricans, *V.* . . . 78
nigritana, *Hook. f.* . 78
nummularia, *Welw.* 74
oligophylla, *Kl.* . . 102
oligosperma, DC. . 94
ornithopodioides, *H. et S.* 101
ornithopodioides, S. et T. 99
orthocarpa, *Baker* . 99
oxalidea, *Welw.* . . 86
paniculata, *Pers.* . 71
parviflora, *Heyne* . 83
parvula, *Del.* . . 81
paucifolia, *Del.* . . 88
pentaphylla, *Linn.* . 82
Perrottetii, *DC.* . . 94
phyllanthoides, *Baker* 96
pilosa, *V.* 82
Prieureana, *G. et P.* 84
pruinosa, *Welw.* . 93
procera, *S. et T.* . 71
psilostachya, *Welw.* 84
pulchra, *V.* 76
Quartiniana, *Rich.* . 92
rhynchocarpa, *Welw.* 92
rigida, W. 87
Rothii, *Baker* . . 77
rufescens, Poir. . . 76
scabra, Roth. . . 87
Schimperi, *J. et S.* . 93
Schimperiana, Hochst. 96
secundiflora, *Poir.* . 94
semitrijuga, *Forsk.* . 93
senegalensis, *Lam.* . 102
sericea, *Benth.* . . 76
sessiliflora, *DC.* . . 79
setiflora, *Baker* . . 90
simplicifolia, *Lam.* . 72
simplicifolia, G. et P. 73
Spachii, *Baker* . . 92
sparsa, *Baker* . . 79
sparsiflora, Hochst. 80
spiniflora, H. et S. . 77
spinosa, *Forsk.* . . 77
stenophylla, *G. et P.* 83
strobilifera, *Hochst.* 75
suaveolens, *J. et S.* . 80
subcorymbosa, *Baker* 91
subulata, *V.* 87
subulifera, *Welw.* . 96
sutherlandioides, *Wel.* 101
tenella, S. et T. . . 103
tenuicaulis, Kl. . . 81
terminalis, *Baker* . 70
tetrasperma, *S. et T.* 72
tettensis, Klotzsch . 93
Thonningii, S. et T. 87
tinctoria, *Linn.* . . 99
tinctoria, Forsk. . 98
torulosa, *Baker* . . 91
trichopoda, *Lepr.* . 78
trigonelloides, *J. et S.* 79
trita, *Linn. f.* . . 86
umbonata, *Welw.* . 98
uncinata, Don . . 98
urostachya, Fenzl . 94
vicioides, *J. et S.* . 81
viscidissima, *Baker* . 100
vicosa, *Lam.* . . . 81
viscosa, var. subglabra, Rich. 82
Welwitschii, *Baker* . 84
Indigastrum deflexum, J. et S. . . . 82
Inga biglobosa, Willd. 324
byrsinocarpa, Hochst. 131
ferruginea, G. et P. 361
Isenbergiana, Rich. 356
malacophylla, Rich. 359, 361
mellifera, Willd. . 340
Nefasia, Hochst. . 347
Quartiniana, Rich. 360
Sassa, Willd. . . 362
senegalensis, DC. . 324
Zygia, DC. . . . 362
Isnardia multiflora, G. et P. . . . 490

Jambosa owariensis, DC. 438
Johnia Petitiana, Rich. 179
Wildenovii, Hook. f. 189
Jolliffia africana, Boj. 524
Jussiæa 488
acuminata, *Sw.* . . 489
alternifolia, E. Mey. 488
altissima, G. et P. . 490
angustifolia, Lam. . 489
diffusa, *Forsk.* . . 488
fluitans, Hochst. . 488
linearis, Willd. . . 489
linifolia, *Vahl.* . . 489
nubica, Hochst. . 490
pilosa, *H. B. K.* . 488
repens, Linn. . . . 488
stolonifera, G. et P. 488
villosa, *Lam.* . . 489

Kalanchoe 391
ægyptiaca, DC. . . 394
Afzeliana, *Britten* . 393
angustifolia, *Rich.* . 392
brachycalyx, *Rich.* . 396
brachyloba, *Welw.* . 392
brasiliensis, Camb. . 394
coccinea, *Welw.* . . 395
crenata, *Haw.* . . 394
grandulosa, *Hochst.* 396–7
glaucescens, *Britten* 393
grandiflora, *Rich.* . 392
humilis, *Britten*. . 397
laciniata, *DC.* . . 392
modesta, K. et P. . 396
Petitiana, Rich. . 394
platysepala, *Welw.* . 393
pubescens, Br. . . 396

Page
Quartiniana, *Rich.* . 391
scapigera, *Welw.* . 397
Schimperiana, *Rich.* 391
spathulata, DC. . . 394
stenosiphon, *Britten* 395
velutina, *Welw.* . . 396
Verea, *Pers.* 394
Welwitschii, *Britten.* 394
Kennedya arabica, H. et S. 181
Kissenia, ... 500
spathulata, *Br.* . . 501
Kotschya africana, Endl. 154
Kuara 183

Lablab uncinatus, A. Br. 210
vulgaris, Savi . . 210
Lagenaria 529
angolensis, Naud. . 528
idolatrica, Ser. . . 529
mascarina, Naud. 528, 532
sphærica, E. Mey. . 532
vulgaris, *Ser.* . . 529
Laguncularia . . . 419
racemosa, *Gært.* . . 419
Lathyrus 173
annuus, *Linn.* . . 174
pratensis, *Linn.* . 173
sativus, *Linn.* . . 174
sphæricus, *Retz.* . 174
Lawsonia 482
alba, *Lam.* 483
inermis, Linn. . . 483
spinosa, Linn. . . 483
LEGUMINOSÆ . . . 1
Leobordea abyssinica, Hochst. . . . 6
Lepidanthemum triplinervium, Kl. . . 452
Leucæna 337
glauca, *Bth.* . . . 337
Leucomphalus . . . 251
cappariderus, *Bth.* . 251
Limeum 595
argute-carinatum W. et P. . . . 596
glomeratum, E. et Z. 596
indicum, *Stocks* . . 596
linifolium, *Fenzl* . 596
Meyeri, *Fenzl* . . 596
viscosum, *Fenzl* . . 595
LOASEÆ 500
Locellaria bauhinioides, Welw. 291
Lonchocarpus . . . 241
Barteri, *Benth.* . . 243

Page
cyanescens, *Benth.* . 243
domingensis, DC. . 242
? fasciculatus, *Benth.* 243
Formosianus, DC. . 241
Heudelotianus, Baill. 244
laxiflorus, G. et P. . 242
macrophyllus, H. B. K. . . . 242
? macrostachyus, *Hook. f.* . . . 243
pallescens, *Welw.* . 242
Philenoptera Benth. 242
pyxidarius, DC. . . 241
sericeus, *H.B.K.* . 241
Sophiæ, K. et P. . 242
tomentosus, Tul. . . 241
Lorandra, Baill. . 371–2
Lotononis 5
angolensis, *Welw.* . 6
Bainesii, *Baker* . . 6
clandestina, *Benth* . 6
Leobordea, *Benth* . 5
lotoides, Del. . . 6
persica, Sph. . . 6
platycarpus, *Viv.* . 6
sphærosperma, Sph. 6
tenuis, *Baker* . . 5
Lotus 61
arabicus, *Linn.* . . 62
brachycarpus, *H. et S.* 62
corniculatus, *Linn.* . 63
creticus, *Linn.* . . 63
Garcini, *DC.* . . . 63
glinoides, *Del.* . . 63
mossamedensis, *Welw.* 62
nubicus, *Hochst.* . 61
tigrensis, *Baker* . . 61
Loxospermum cælocephalum, Hochst. . 56
multinerve, Hochst. 56
Schimperi, Hochst. . 56
Ludwigia 490
abyssinica, Rich. . 491
diffusa, Ham. . . 491
jussiæoides, *Lam.* . 490
multiflora, Walp. . 490
parviflora, *Roxb.* . 490
prostrata, *Roxb.* . . 491
Luffa 530
acutangula, Roxb. . 530
ægyptiaca, *Mill.* . 530
cylindrica, Rœm. . 530
echinata, *Roxb.* . . 531
fœtida, Cav. . . . 530
pentandra, Roxb. . 530
scabra, S. et T. . . 530
sphærica, Sond. . 532
tuberosa, Roxb. . . 540

Page
Lumnitzera 418
racemosa, *Willd.* . 418
Lupinus 44
Termis, *Forsk.* . . 44
LYTHRACEÆ 464
Lythrum 465
rotundifolium, *Hchst.* 465
sagittæfolium, Sond. 471
Thymifolia, *Linn.* . 465

Machadoa 520
huillensis, *Welw.* . 520
Macrocymbium Vogelii, Walp. 182
Macrolobium . . . 297
demonstrans, *Oliv.* . 299
Heudelotii, *Pl.* . . 298
Palisoti, *Benth.* . . 297
stipulaceum, *Benth.* 299
Maria-Antonia orientalis, Parl. . . 16
Mavea judicialis, Bertol. 321
Medicago 50
apiculata, W. . . 52
denticulata, *W.* . . 51
græca, Horn . . . 51
laciniata, *All.* . . 51
lupulina, *Linn.* . . 51
minima, *Lam.* . . 51
orbicularis, *All.* . . 51
tentaculata, *W.* . . 52
truncatulata, Gært. 52
Medinilla 460
Mannii, *Hook. f.* . 460
Melanosticta Burchelli, DC. 264
Melastoma Afzelianum, Don 442
albiflorum, Don . . 446
capitatum, Don . . 450
corymbosa, Sims. . 456
cymosum, Vent. . . 456
decumbens, Beauv. . 452
elongatum, Don . . 455
involucratum, Don . 455
plumosa, Don . . 452
prostrata, S. et T. . 452
MELASTOMACEÆ . . 439
Melastomastrum erectum, Naud. . . 450
Melilotus 52
abyssinica, *Baker* . 53
gracilis, DC. . . . 52
italica, Rich. . . . 53
neapolitana, Ten. . 53
parviflora, *Desf.* . . 52
Melothria 562

Page

cordifolia, *Hook. f.* . 563
deltoidea, *Benth.* . 563
fœtida, Lam. . . . 564
Thwaitesii, Schw. . 562
triangularis, *Benth.* . 562
tridactyla, *Hook. f.* 562
Memecylon 460
Barteri, *Hook. f.* . 462
cæruleum, *G. et P.* . 461
Donianum, *Pl.* . . 463
fasciculare, *Pl.* . . 463
Heudelotii, Naud. . 463
Mannii, *Hook. f.* . 461
membranifolium,
Hook. f. . . . 462
polyanthemos, *Hk. f.* 463
virescens, *Hook. f.* . 463
Vogelii, *Naud.* . . 462
Mesembryanthemum . 582
dactylinum, *Welw.* . 582
dimorphum, *Welw.* . 582
Mezoneurum . . . 260
angolense, *Welw.* . 261
Benthamianum, *Baill.* 261
Welwitschianum, *Ol.* 261
Microcharis 132
angolensis, *Baker* . 132
latifolia, *Bth.* . . 132
tenella, *Bth.* . . . 132
Milletia 126
? aboensis, *Hook. f.* . 130
drastica, *Welw.* . . 128
ferruginea, *Baker* . 130
gracilis, *Welw.* . . 129
Griffoniana, Baill. . 128
macrophylla, *Hook. f.* 127
? Mannii, *Baker* . . 127
nudiflora, *Welw.* . 130
rhodantha, *Baill.* . 131
Thonningii, *Baker* . 127
urophylla, *Welw.* . 129
versicolor, *Welw.* . 129
Miltus africana, Lour. 594
Mimosa 335
adianthifolia, S. et T. 361
adstringens, S. et T. 353
asperata, *Linn.* . . 335
bicolor, S. et T. . . 333
glaberrima, S. et T. . 358
guineensis, S. et T. . 355
? *Kantuffa*, Bruce . 264
mellifera, V. . . . 340
pentagona, S. et T. . 346
polyacantha, Willd. . 335
procumbens, S. et T. 335
pudica, Linn. . . 336
sanguinea, Bruce . 333
scandens, Linn. . . 325

Page

senegalensis, Lam. . 342
taxifolia, Pers. . . 324
violacea, *Bolle* . . 336
Mimoseæ 321
Modecca 512
abyssinica, *Hochst.* . 514
cissampeloides, Pl. . 518
cynanchifolia, Bth. 519
diversifolia, S. et T. 517
gummifer, *H. et S.* . 519
Kirkii, *Mast.* . . 515
lobata, *Jacq.* . . . 516
Mannii, *Mast.* . . 516
parviflora, Don . . 519
senensis, *Mast.* . . 513
stricta, *Mast.* . . 515
tamnifolia, Pl. . . 517
tenuifolia, Pl. . . 517
trisecta, *Mast.* . . 514
Welwitschii, *Mast.* . 513
Mollugo 589
Bainesii, *Oliv.* . . 590
bellidifolia, *Ser.* . . 591
Cerviana, *Ser.* . . 591
denticulata, G. et P. 591
fragilis, *W. et P.* . 592
glinoides, Rich. . . 590
Glinus, *Rich.* . . . 590
nudicaulis, *Lam.* . 591
Pauli-Wilhelmi,
Schw. 589
Schrankii, *Ser.* . . 592
Spergula, *Linn.* . . 590
umbellata, Ser. . . 591
verticillata, G. et P. 591
verticillata, *Linn.* . 591
Momordica 534
Adoensis, Hochst. . 552
anigosantha, *Hook. f.* 536
anthelmintica, S. et T. 538
Balsamina, *Linn.* . 537
cardiospermoides, *Kl.* 535
Charantia, *Linn.* . 537
cissoides, *Pl.* . . . 535
cordifolia, Sond. . 539
corymbifera, *Hook. f.* 539
cucullata, *Hook. f.* . 538
Cymbalaria, *Fenzl* . 540
dasycarpa, Hochst. 543
echinocarpa, Fenzl . 531
? *fœtida*, S. et T. . 539
guttata, Pl. . . . 535
maculata, Pl . . 535
Mannii, *Hook. f.* . 539
Morkorra, *Rich.* . . 538
multiflora, *Hook. f.* 540
pterocarpa, *Hochst.* . 536
senegalensis, Lam. . 538

Page

Schimperiana, Naud. 539
trifoliolata, *Hook. f.* 537
Welwitschii, *Hook. f.* 538
Mucuna 184
coriacea, *Baker* . . 187
cylindrosperma, *Wel.* 186
flagellipes, *Vog.* . . 185
melanocarpa, *Hochst.* 186
pruriens, *DC.* . . 187
quadrialata, *Baker.* 186
stans, *Welw.* . . . 187
urens, *DC.* . . . 185
Mukia 561
madraspatana, Asch. 561
scabrella, *Arn.* . . 561
Mundulea 126
suberosa, *Benth.* . 126
Myosurandra moschata,
Baill. 404
Myrothammus . . . 404
flabellifolia, *Welw.* . 404
Myrtaceæ 436

Napoleona 439
Heudelotii, Juss. . 439
imperialis, *Beauv.* . 439
Vogelii, Hook. et Pl. 439
Whitfieldii, Dec. . 439
Neptunia 333
oleracea, *Lour.* . . 334
stolonifera, G. et P. 334
Nerophila 441
gentianoides, *Naud.* 441
Nesæa 470
andongensis, *Welw.* . 473
Candollii, *G. et P.* . 473
cordata, *Hiern* . . 475
erecta, *G. et P.* . 474–5
floribunda, *Sond.* . 474
heptamera, *Hiern* . 472
humilis, Kl. . . . 475
icosandra, *K. et P.* . 471
linearis, *Hiern* . . 475
linifolia, *Welw.* . . 472
lythroides, *Welw.* . 171
pedicellata, *Hiern* . 472
radicans, *G. et P.* . 474
Neurada 381
procumbens, *Linn.* . 382
Nicolsonia caffra, E.
Mey. 165
reptans, Meiss. . . 166
setigera, E. Mey. . 163

Oligostemon 267
pictus, *Benth.* . . 267
Olinia 485
acuminata, Kl. . . 485

	Page
capensis, Kl.	485
cymosa, *Thunb.*	485
Rochetiana, Juss.	485
ONAGRARIEÆ	486
Onobrychis	141
eriophora, Rich.	142
Ononis	48
Aucheri, J. et S.	64
Cherleri, *Linn.*	48
coriifolia, Reich.	156
parvula, Steud.	48
reclinata, Schw.	48
Ophiocaulon	517
cissampeloides, *Mast.*	518
cynanchifolius, *Mast.*	519
gummifer, *Mast.*	518
OPUNTIEÆ	580
Oreosyce	548
africana, *Hook. f.*	548
Ormocarpum	142
bibracteatum, *Baker*	142
coronilloides, Don	142
sennoides, *DC.*	142
verrucosum, *Beauv.*	142
Ormosia	255
angolensis, *Baker*	255
laxiflora, *Benth.*	255
Ornithopus	139
coriandrinus, *Hochst.*	140
Orygia	589
decumbens, *Forsk.*	589
mucronata, Kl.	589
Osbeckia	441
antherotoma, *Naud.*	444
canescens, *E. Mey.*	453
decumbens, DC.	452
eximia, Sond.	455
grandiflora, Sm.	455
multiflora, *Sm.*	442
phæotricha, Hochst.	451
rotundifolia, Sm.	452
senegambiensis, *G. et P.*	443
tubulosa, *Sm.*	442
Umlaasiana, Hochst.	453
Osbeckiastrum Heudelotii, Naud.	455
Ostryocarpus	240
riparius, *Hook. f.*	240
? Welwitschii, *Baker*	240
Otopteris Burchellii, DC.	196
Pachyrhizus	207
angulatus, *Rich.*	208
? orbicularis, *Welw.*	208
Panciatica purpurea, Picc.	256
Pancovia bijuga, W.	303
PAPILIONACEÆ	1
Parinarium	366
brachystachyum, Bth.	367
capense, *Harv.*	368
chrysophyllum, *Oliv.*	369
curatellæfolium, *Pl.*	368
excelsum, *Sabine*	367
glabrum, *Oliv.*	370
macrophyllum, *Sab*	369
Mobola, *Oliv.*	368
polyandrum, *Benth.*	370
robustum, *Oliv.*	370
senegalense, Perr.	369
subcordatum, *Oliv.*	367
Parkia	323
africana, Br.	324
biglobosa, *Benth.*	324
filicoidea, *Welw.*	324
intermedia, *Oliv.*	324
uniglobosa, Don	324
Parkinsonia	266
aculeata, *Linn.*	267
Parochetus	48
communis, *Ham.*	48
major, Don	49
Paropsia	505
grewioides, *Welw.*	505
guineensis, *Oliv.*	505
PASSIFLOREÆ	503
Passiflora fœtida, Cav.	520
quadrangularis, L.	520
minima, Linn.	520
suberosa, Linn.	520
Pavetta lateriflora, Dn.	464
Peltophorum	260
africanum, *Sond.*	260
Pemphis	482
acidula, *Forst.*	482
Pentaclethra	322
? *Griffoniana*, Baill.	323
macrophylla, *Benth.*	322
Peponia	526
Cienkowskii, *Hook. f.*	527
lagenarioides, *Hk. f.*	527
Vogelii, *Hook. f.*	526
Petersia	438
africana, *Welw.*	439
Phaca Vogelii, Webb	138
Pharnaceum	592
umbellatum, Forsk.	591
verrucosum, *E. et Z.*	592
Phaseolus	191
adenanthus, *E. Mey.*	192
bipunctatus, Jacq.	192
brevipes, Benth.	193
cirrhosus, H. B. K.	192
Cumingii, Benth.	193
Kirkii, *Baker*	194
lunatus, *Linn.*	192
microspermus, Hoch.	197
Mungo, *Linn.*	193
opisotrichus, Hochst.	193
quadrifarius, Hoch.	199
rostratus, Wall.	192
senegalensis, G. et P.	192
subtortus, Benth.	193
trilobus, *Ait.*	194
trinervius, *Heyne*	193
truxillensis, H. B. K.	192
vexillatus, Linn.	199
vulgaris, *Linn.*	193
Philenoptera Kotschyana, Fenzl.	242
Schimperiana, Hoch.	242
Phyllocalyx Quartinianus, Rich.	42
Physedra	552
heterophylla, *Hk. f.*	553
longipes, *Hook. f.*	553
Physostigma	191
venenosum, *Balf.*	191
Pilogyne lucida, Naud.	559
Piptadenia	328
africana, *Hook. f.*	328
? Mannii, *Oliv.*	329
Pisum abyssinicum, Braun	174
arvense, Linn.	174
sativum, Linn.	174
Pithecolobium	363
altissimum, *Oliv.*	364
Platysepalum	131
violaceum, *Welw.*	131
Plectrotropis hirsuta, S. et T.	199
Podalyria aurea, Wild.	253
hæmatoxylon, S. et T.	249
Podiotheca	515
Pogonostigma abyssinicum, J. et S.	125
nubica, Boiss.	125
Poinciana	265
elata, *Linn.*	266
pulcherrima, Linn.	262
regia, Boj.	266
Poivrea aculeata, DC.	424
conferta, Benth.	422
constricta, Benth.	423
glutinosa, Kl. ?	422
grandiflora, Benth.	423
mossambicensis, Kl.	423
Potentilla	376
pensylvanica, *Linn. var.*	376
reptans, *Linn.*	376
supina, *Linn.*	376
Prosopis	331

Page
? dubia, G. et P. . 332
? Kirkii, *Oliv.* . . 332
lanceolata, Benth. . 332
oblonga, *Benth.* . . 331
Psammatropha . . . 593
myriantha, *Sond.* . 593
Pseudarthria . . . 167
confertiflora, *Baker* 167
fagifolia, *Baker* . . 167
Hookeri, *W. et A.* . 168
macrophylla, *Welw.* 168
Psophocarpus . . . 208
longepedunculatus, *Hassk.* 208
palmettorum, G. et P. 209
tetragonolobus, DC. . 209
Psoralea 64
andongensis, *Welw.* 65
obtusifolia, *DC.* . . 64
plicata, *Del.* . . . 64
Pterocarpus 237
abyssinicus, Hochst. 239
Adansonii, DC. . 240
angolensis, DC. . 240
apterus, Gært. . . 237
Ecastaphyllum, Linn. 236
echinatus, DC. . . 240
erinaceus, *Poir.* . . 239
esculentus, *S. et T.* 238
lucens, *G. et P.* . . 238
lunatus, Linn. f. . 237
madagascariensis, Boj. 246
melliferus, *Welw.* . 239
santolinoides, L'Her. 238
sericeus, Benth. . . 239
simplicifolius, *Baker* 238
tinctorius, *Welw.* . 239
Pterolobium 264
abyssinicum, Rich. . 264
lacerans, *Br.* 264
Pygeum 373
africanum, *Hook. f.* 373
Pyramidocarpus . . . 495
Blackii, *Oliv.* . . 495

Quartinia abyssinica, Rich. 264
turfosa, Rich. . . 470
Quisqualis 435
ebracteata, Beauv. . 435
indica, *DC.* . . . 435

Raphanocarpus . . . 540
Kirkii, *Hook. f.* . 541
Welwitschii, *Hook. f.* 541
Raphanus pilosus, Wld. 503
Rathkea glabra, S. et T. 143

Page
Requienia obcordata, DC. 126
sphærosperma, DC. 125
Rhaphidiocystis . . 553
Mannii, *Hook. f.* . 554
Welwitschii, *Hook. f.* 554
Rhipsalis 581
Cassytha, *Gært.* . . 581
Rhizophora 407
Candelaria, DC. . 408
Mangle, *Linn.* . . 408
mucronata, *Lam.* . 407
racemosa, *G. F. W. Mey.* 408
RHIZOPHORACEÆ . . 406
Rhyacophila 470
repens, *Hochst.* . . 470
Ruppellia abyssinica, Rich. 149
Rhynchosia 216
Afzelii, Br. . . . 225
? antennulifera, Baker 223
Borianii, Schw. . 180
cajanoides, G. et P. 228
calycina, *G. et P.* . 217
caribæa, *DC.* .. . 220
Cienkowskii, Schw. . 107
confertiflora, Rich. . 167
congensis, *Baker* . 217
cyanosperma, *Benth.* 218
debilis, *Hook. f.* . 222
densiflora, *DC.* . . 222
discolor, Kl. . . . 221
elegans, *Rich* . . . 221
ervoidea, DC. . . 219
faginea, G. et P. . 230
ferruginea, *Rich.* . 221
filicaulis, *Welw.* . 221
flagellaris, Fenzl . 219
flavissima, *Hochst.* . 219
gibba, E Mey. . . 220
glomerata, G. et P. . 228
Grantii, *Baker* . . 223
inflata, Boj. . . . 220
intermedia, K. et P. 220
latissima, *Welw.* . 221
longepedunculata, Hochst. . . . 227
malacophylla, Boj. . 220
Mannii, *Baker* . . 217
medicaginea, DC. . 219
melanosperma, Kl. . 220
Memnonia, *DC.* . . 220
minima, *DC.* . . 219
nuda, DC. . . . 219
polystachya, Rich. . 225
pubescens, DC. . . 220
punctata, DC. . . 219

Page
resinosa, *Hochst.* . 218
rhombifolia, DC. . 219
sennaarensis, Hoch. 219
splendens, *Schw.* . 219
stipulosa, Rich. . . 222
tuberosa, Hochst. . 225
viscosa, *DC.* . . . 222
Rhynchocarpa . . . 563
africana, Asch. . . 564
Bainesii, *Hook. f.* . 564
corallina, Naud. . 565
Courbonii, Naud. 564, 567
Ehrenbergii, Asch. . 566
erostris, Schw. . . 567
fœtida, *Schrad.* . . 564
fœtidissima, Walp. . 564
Gijef, Schw. . . . 566
hirtella, Naud. . . 564
pedunculosa, Naud. 564
Schimperi, Naud. . 564
Welwitschii, Naud. . 566
Robinia argentiflora, S. et T. . . . 242
cyanescens, S. et T. 243
sericea, Poir. . . . 241
subdecandra, L'Her. 253
Thonningii, Sch. . 128
violacea, Beauv. . 242
Rochea dichotoma, Hoch. 388
Rosa 380
abyssinica, *Br.* . . 381
centifolia, Linn. . 381
Schimperiana, H. et S. 381
ROSACEÆ 364
Rotala 466
decussata, *DC.* . . 467
elatinoides, *Hiern* . 466
filiformis, *Hiern* . 468
fontinalis, *Hiern* . 468
myriophylloides, *Welw.* . . . 469
nummularia, *Welw.* 468
Roxburghiana, Wt. . 467
serpiculoides, *Welw.* 469
stagnina, *Hiern* . . 467
tenella, *Hiern* . . 467
verticillaris, *Linn.* . 467
Rothia 7
hirsuta, *Baker* . . 7
Rubus 374
apetalus, *Poir.* . . 374
compar, Br. . . . 375
exsuccus, Steud. . 375
Petitianus, Rich. . 375
pinnatus, *Willd.* . 374
Quartinianus, Rich. 375
rigidus, *Sm.* . . . 375
Steudneri, *Schw.* . 375

Page
Sakersia 458
africana, *Hook. f.* . 458
echinulata, *Hook. f.* 458
SAMYDACEÆ 492
Saxifraga 382
hederæfolia, *Hochst.* 383
SAXIFRAGACEÆ . . . 382
Schotia 309
capitata, *Bolle* . . 310
humboldtioides, *Oliv.* 310
simplicifolia, V. . 285
tamarindifolia, Afz. 310
Schousboa commutata, Spr. 419
Schrankia 336
leptocarpa, *DC.* . . 336
Scorpiurus 139
echinata, Rich. . . 139
subvillosa, H. et S. . 139
sulcata, *Linn.* . . 139
Scytalis anomala, Vog. 207
helicopus, E. Mey. . 206
retusa, E. Mey . . 207
Sedum 399
Epidendrum, *Hochst.* 399
Schimperi, *Britten* . 400
Seguiera nudiflora, Reichb. 424
Semonvillea 594
pterocarpa, *Gay* . . 595
punctata, Steud. . 595
Sempervivum 400
abyssinicum, *Hochst.* 401
arboreum, Linn. . . 401
chrysanthum, *Hochst.* 400
molle, *Vis.* 401
simense, Hochst. . . 399
Senna ovalifolia, Batk. 278
Serpicula 405
brasiliensis, Camb. . 405
repens, *Linn.* . . 405
Sesbania 133
aculeata, *Pers.* . . 134
ægyptiaca, *Pers.* . 134
cinerascens, *Welw.* 134
ferruginea, Hochst. 131
filiformis, Hochst. 133, 135
leptocarpa, *DC.* . . 135
mossambicensis, Kl. . 135
multijuga, Schw. . 133
pachycarpa, *DC.* . 134
picta, Pers. . . . 134
pubescens, *DC.* . . 135
punctata, *DC.* . . 133
sphærosperma, *Welw.* 135
tetraptera, *Hochst.* . 136

Page
Sesuvium 585
brevifolium, S. et T. 586
congense, *Welw.* . 586
crithmoides, Welw. . 586
crystallinum, *Welw.* 586
digynum, *Welw.* . . 586
mesembryanthemoides, Welw. 586
Portulacastrum, *Linn.* 585
Sheadendron molle, Kl. 430
Shuteria 177
africana, *Hook. f.* . 177
Sicyos 568
angulatus, *Linn.* . 568
Schimperi, Naud. . 569
Smeathmannia . . . 506
lævigata, *Br.* . . 507
media, Br. . . . 507
pubescens, *Br.* . . 506
Smithia 151
abyssinica, Hochst. . 152
æschynomenoides, *Welw.* 153
capitulifera, *Welw.* . 152
Kotschyi, *Bth.* . . 153
nodulosa, *Baker* . . 153
sensitiva, *Ait.* . . 152
spicata, Spreng. . . 154
strigosa, *Bth.* . . 154
strobilantha, *Welw.* 154
Soemmeringia psittacorhyncha, Webb . 155
Sommerfeldtia obovata, S. et T. 237
Sonneratia 483
acida, *Linn. f.* . . 483
mossambicensis, Kl. 484
Sophora 253
crassifolia, Duh. . 254
inhambanensis, Kl. . 254
littoralis, DC. . . 254
nitens, S. et T. . . 254
oligophylla, *Baker* . 254
tomentosa, *Linn.* . 254
? zambesiaca, *Baker* 253
Spaendoncea tamarindifolia, Desf. . . 256
Sphæridiophorum abyssinicum, J. et S. . 70
linifolium, Desv. . 70
Sphærosicyos . . . 532
Meyeri, *Hook. f.* . 532
Spartium thebaicum, Del. 11
Spathandra memecyloides, Benth. . . 462
Spatholobus 188
? africanus, *Baker* . 188

Page
Sphenostylis marginata, E. Mey. . . . 203
Staphylosyce 554
Barteri, *Hook. f.* . 555
Stizolobium pruriens, Pers. 187
urens, Pers. . . . 185
Strephonema . . . 484
Mannii, *Hook. f.* . 484
sericea, *Hook. f.* . 484
Strophostylis capensis, E. Mey. . . . 199
Stylosanthes 155
Bojeri, *Vog.* . . . 157
erecta, *Beauv.* . . 156
flavicans, *Baker* . . 156
guineensis, S. et T. . 156
mucronata, *W.* . . 157
setosa, H. et S. . . 157
viscosa, *Ser.* . . . 156
Suffrenia capensis, Harv. 468
filiformis, Bell . . 468
Swartzia 257
madagascariensis, *Desv.* 257
marginata, Bth. . . 257
Sylitra 103
angolensis, *Baker* . 103
Syzygium cordatum, Hochst. . . . 438
cordifolium, Kl. . 438
owariense, Bth. . . 438

Tæniocarpum articulatum, Desv. . . 208
Tamarindus 307
indica, *Linn.* . . 308
officinalis, Hook. . 308
Taverniera 140
abyssinica, *Rich.* . 141
ægyptiaca, *Boiss.* . 140
cyclophylla, Hochst. 141
floribunda, Schw. . 141
lappacea, *DC.* . . 140
Schimperi, J. et S. . 141
Telfairia 523
occidentalis, *Hook. f.* 524
pedata, *Hook.* . . 523
Tephrosia 104
acaciæfolia, *Welw.* . 106
æquilata, *Baker* . . 113
andongensis, *Welw.* 116
Anselii, *Hook. f.* . 115
anthylloides, *Hochst.* 118
Apollinea, *DC.* . . 124
Apollinea, G. et P. . 118
Apollinea, Kl. . . 123
barbigera, *Welw.* . 113

bracteolata, G. et P. 116
brunnea, *Baker* . . 122
capillipes, *Welw.* . 108
cephalantha, *Welw.* 119
conciuna, *Baker* . . 112
Cordofana, Hochst. 118
coronilloides, *Welw.* 123
dasyphylla, *Welw.* . 118
decidua, Steud. . . 118
decora, *Welw.* . . 123
deflexa, *Baker* . . 111
densiflora, *Hook. f.* . 114
dichroocarpa, *Steud.* 110
dimorphophylla, *Welw.* 116
disperma, *Welw.* . 108
drepanocarpa, *Welw.* 124
Ehrenbergiana, Schw. 123
elegans, *S. et T.* . . 118
elongata, *Hook. f.* . 111
emeroides, *Rich.* . 108
flexuosa, *Don.* . . 111
Forbesii, Baker . . 116
fulvinervis, *Hochst.* 111
gracilipes, *G. et P.* . 119
huillensis, *Welw.* . 121
humilis, G. et P. . 109
icthynica, Bert. . . 126
incana, *Grah.* . . 123
indigofera, Bert. . 124
interrupta, H. et S. 110
Kirkii, *Baker* . . 115
Kotschyana, Hochst. 116
lævigata, *Welw.* . . 107
leptostachya, DC. . 124
linearis, *Pers.* . . . 120
longipes, *Meiss.* . 120
lupinifolia, *DC.* . . 107
melanocalyx, *Welw.* 106
modesta, Steud. . . 45
nana, *Kotsch.* . . 109
noctiflora, *Boj.* . . 112
nubica, *Baker* . . 125
obcordata, *Baker* . 125
oxygona, *Welw.* . . 114
paniculata, *Welw.* . 122
pedicellata, *Baker* . 117
Petersiana, Kl. . . 126
platycarpa, *G. et P.* 109
polysperma, *Baker* . 113
pulchella, *Hook. f.* . 120
purpurea, *Pers.* . . 124
radicans, *Welw.* . . 121
reptans, *Baker* . . 121
rigida, *Baker* . . 114
rigidula, *Welw.* . . 112
secunda, *Welw.* . . 115
sericea, *Baker* . . 107
sphærosperma, *Baker* 125
suberosa, DC. . . 126
subtriflora, *Hochst.* . 117
vicioides, *Rich.* . . 117
villosa, *Pers.* . . 122
Vogelii, *Hook. f.* . 110
Teramnus 180
labialis, *Spr.* . . 180
Terminalia 415
avicennioides, *G. et P.* 416
Brownii, *Fres.* . . 415
Catappa, *Linn.* . . 416
confertifolia, *Rich.* . 415
cycloptera, Br. . . 415
glabra, *Roxb.* . . 417
glaucescens, *Pl.* . . 416
hemignosta, Steud. . 415
hirta, Steud. . . . 432
macroptera, *G. et P.* 416
mollis, *Laws* . . . 417
pruinoides, *Laws* . 415
psidiifolia, Del. . 417
salicifolia, *Schw.* . 417
scutifera, *Pl.* . . 417
sericea, *Bruch.* . . 416
Ternatea vulgaris, H. B. K. 177
Tetragonia 583
reduplicata, *Welw.* . 583
Tetrapleura 330
andongensis, *Welw.* 331
obtusangula, *Welw.* 331
Thonningii, *Benth.* . 330
Thysantha subulata, Hook. 387
Tillæa 386
alsinoides, *Hook. f.* 387
aquatica, Lam. . . 388
aquatica, *Linn.* . . 388
pentandra, *Roxb.* . 386
pharnaceoides, *Hochst.* 387
subulata, *Benth. et Hook.* 387
Vaillantii, *Willd.* . 387
Trachylobium . . . 311
Gærtnerianum, Hayne 311
Hornemannianum, *Hayne* 311
mossambicense, Kl. 311
verrucosum, Gært. . 311
Trapa 491
bispinosa, *Roxb.* . 491
natans, *Linn.* . . 491
Trianosperma . . . 568
africana, *Hook. f.* . 568
Trianthema 587
crystallina, *V.* . . 587
flexuosa, S. et T. . 587
monogyna, *Linn.* . 587
obcordata, Roxb. . 587
pentandra, *Linn.* . 588
polysperma, *Hochst.* 588
salsoloides, *Fenzl* . 588
sedifolia, *Vis.* . . 588
Trichosanthes fœtidissima, Jacq. . . 564
Trifolium 53
acaule, *Steud.* . . 55
africanum, *Ser.* . . 59
alexandrinum, *Linn.* 59
arvense, *Linn.* . . 54
bilineatum, *Fres.* . 58
calocephalum, *Fres.* 56
cryptopodium, *Steud.* 57
fragiferum, *Linn.* . 54
multinerve, *Rich.* . 56
Petitianum, *Rich.* . 57
polystachyum, *Fres.* 58
procumbens, *Linn.* . 57
Quartinianum, *Rich.* 55
Ruppellianum, Fres. 58
Schimperi, *Rich.* . 55
semipilosum, *Fres.* . 56
simense, *Fres.* . . 57
Steudneri, *Schw.* . 54
subrotundum, *S. et H.* 59
tembense, *Fres.* . . 59
umbellulatum, *Rich.* 55
Trigonella 49
arguta, Vis. . . . 50
Fœnum-græcum, *Lin.* 49
glabra, Thb. . . . 49
hamosa, *Linn.* . . 49
laciniata, *Linn.* . . 50
marginata, *Hochst. et Steud.* . 50, 59, 596
multinervis, H. et S. 56
occulta, *Del.* . . . 49
Schimperi, H. et S. 56
Tristemma 445
coronatum, *Benth.* . 446
erectum, G. et P. . 450
hirtum, *Vent.* . . 446
incompletum, Br. . 446
involucratum, *Benth.* 445
littorale, Benth. . 446
Schumacheri, *G. et P.* 446
Trochomeria . . . 524
macrocarpa, *Hook. f.* 524
macroura *Hook. f.* . 525
vitifolia, *Hook. f.* . 525
Tryphostemma, *Harv.* 507
zanzibaricum, *Mast.* 508
Turia Gijef, Forsk. . 566
Turneraceæ 50

Umbilicus botryoides, *Hochst.* . . . 398
pendulinus, DC. . 398
seminensis, J. Gay . 399
Uraria 168
picta, *Desv.* . . . 169

Vahlia 383
capensis, Thunb . . 384
cordofana, Hochst. . 384
macrantha, Kl. . . 384
Oldenlandiæ, DC. . 384
Oldenlandioides, *Roxb.* 384
ramosissima, A.DC. 383-4
sessiliflora, DC. . . 383
silenoides, A. DC. . 384
tomentosa, A. DC. . 384
viscosa, *Roxb.* . . 383
Weldenii, Reichb. . 383
Vereia crenata, Audr. . 393
Vicia 172
abyssinica, Alef. . 172
Faba, Linn. . . . 173
hirsuta, *Koch.* . . 173
paucifolia, *Baker* . 173
sativa, *Linn. var.* . 172
Vigna 194
Afzelii, *Baker* . . 202
ambacensis, *Welw.* . 201
andongensis, *Baker* . 197
angustifolia, Hook.f. 200
anomala, Walp. . . 207
Burchellii, *Harv.* . 195
cærulea, *Baker* . . 203
comosa, *Baker* . . 202
crinita, *Rich.* . . 197
Donii, *Baker* . . . 202
frutescens, *Rich.* . 194
glabra, Savi . . . 206
golungensis, *Baker* . 199
gracilis, Hook. f. . 205
hastifolia, *Baker* . 200
heterophylla, *Rich.* . 197
holosericea, *Welw.* . 200
huillensis, *Welw.* . 204
Kotschyi, Schw. . . 198
lancifolia, *Rich.* . . 196
linearifolia, Hook. f. 198
lobelifolia, *Baker* . 199
lutea, *A. Gr.* . . 206
luteola, *Benth.* . . 205
marginata, *Benth.* . 202
membranacea, *Rich.* 197
multiflora, *Hook. f.* . 205
nilotica, *Hook. f.* . 204
oblonga, *Benth.* . . 206
oblongifolia, *Rich.* . 196
opisotricha, Rich. . 193
ornata, *Welw.* . . 203
parvifolia, *Pl.* . . 206
parviflora, *Welw.* . 201
phaseoloides, *Baker* . 200
pubigera, *Baker* . . 201
radicans, *Welw.* . . 198
reticulata, *Hook. f.* . 198
retusa, Walp. . . 207
Schimperi, *Baker* . 201
sinensis, *Endl.* . . 204
Thonningii, Hook. f. 200
triloba, *Walp.* . . 204
tuberosa, Rich. . . 199
venulosa, *Baker* . . 203
vexillata, *Benth.* . 199
villosa, Savi . . . 206
Virgilia aurea, *Lam.* . 253
Voandzeia 207
subterranea, *Th.* . . 207
Vouapa crassifolia, Baill. 298
demonstrans, Baill. . 299
explicans, Baill. . 298
macrophylla, Baill . 298

Weihea 410
africana, *Benth.* . . 410
Afzelii, *Oliv.* . . . 411
plumosa, *Oliv.* . . 411
Westia grandiflora, V. 294, 309
parviflora, V. . . 294
Woodfordia 481
floribunda, *Salisb.* . 481
Wormskioldia . . . 501
abyssinica, Rich. . 502
diversifolia, Rich. . 503
glandulifera, *Kl.* . 503
heterophylla, *S. et T.* 502
longepedunculata, *Mast.* 502
serrata, *Hochst.* . . 502
? tanacetifolia, Kl. . 503

Xerocarpus abyssinicus, Schw. 6
hirsutus, G. et P. . 7

Zehneria 558
angolensis, *Hook. f.* . 559
cerasiformis, Stocks 558
deltoidea, *Hook. f.* . 560
longepedunculata, Hochst. . . 559, 560
lucida, Hook. f. . . 559
macrocarpa, Sond. . 524
micrantha, *Hook. f.* . 560
microsperma, *Hook. f.* 559
Peneyana, Naud. . 561
racemosa, *Hook. f.* . 561
scabra, *Sond.* . . . 560
scrobiculata, *Hochst.* 559
velutina, *Endl.* . . 560
Zornia 158
angustifolia, G. et P. 158
capensis, Pers. . . 159
diphylla, *Pers.* . . 158
glochidiata, Reich. . 158
gracilis, DC. . . . 158
tetraphylla, *Michx.* 159
Zygia Brownei, Walp. 363
fastigiata, E. Mey. 361, 362

END OF VOL. II.

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CONTENTS.

	PAGE
NEW SERIES OF NATURAL HISTORY	3
BOTANY	5
FERNS	10
MOSSES	11
SEAWEEDS	12
FUNGI	13
SHELLS AND MOLLUSKS	14
INSECTS	16
ANTIQUARIAN	18
MISCELLANEOUS	20
SERIALS	23
RECENTLY PUBLISHED	23
FORTHCOMING WORKS	24

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